Vol. I. No. 3 *July-Sept., 1917*

OCT 5 1917
UNIV. OF MICH.
LIBRARY

ENDOCRINOLOGY:

The BULLETIN of the ASSOCIATION for the STUDY of the INTERNAL SECRETIONS.

CONTENTS

CLINICAL ENDOCRINOLOGY 273

REACTIONS OF THE THYROID GLAND TO NOXIOUS AND DIETARY INFLUENCES 275

THE EXTENT OF THE PRESENT DAY ENDOCRINE LITERATURE . . 279

PRESENT-DAY ENDOCRINOLOGY FROM THE STANDPOINT OF THE PEDIATRICIAN 282

REPORT OF A CASE OF DYSTROPHIA ADIPOSO-GENITALIS. By W. W. Roblee, Riverside, California 286

THE RELATION OF THE ADRENAL GLANDS TO THE CIRCULATION OF THE BLOOD. By R. G. Hoskins, Chicago 292

THE VASOMOTOR EFFECTS OF ADRENIN WHEN ADMINISTERED WITHOUT ANESTHESIA. By E. L. Berry, Chicago 306

DIABETES INSIPIDUS: A METABOLIC STUDY OF THE EFFECTS OF PITUITARY ADMINISTRATION. By John R. Williams, Rochester, N. Y. . 312

A CASE OF ADDISON'S DISEASE. By Gustav Baar, Portland, Ore. . . 326

THE LITERATURE ON THE INTERNAL SECRETIONS. Containing 176 Titles and Articles Reviewed

Published Quarterly by The Association for the Study of the Internal Secretions, R. G. Hoskins, Ph. D., Editor, Northwestern University Medical School, Chicago, Ill.; Henry R. Harrower, M. D., Managing Editor, Glendale, California. Subscription Rates: $5.00 a Year in Advance. Single Copies $1.50, postpaid.

Entered as Second Class Matter at the Postoffice in Los Angeles, Cal.

Parathyroids—
Powder and Tablets, 1-20 grain.

Red Bone Marrow—
(Medullary Glyceride) Hematogenetic, Histogenetic.

Corpus Luteum—
(True Substance)
Powder, Tablets and 2 and 5 grain Capsules.

Armour's
LABORATORY
PRODUCTS

Elixir of Enzymes—
Digestant and palatable vehicle.

Pineal Substance—
Powder and Tablets, 1-20 grain.

Pituitary, Anterior—
Powder and Tablets, 2 grain.

Pituitary, Posterior—
Powder and Tablets, 1-10 grain.

Pituitary Liquid
(*Armour*)

A pure, potent preparation of the Posterior Pituitary Body. Uniform and reliable alike, in surgical and obstetrical work.

PITUITARY LIQUID (Armour) is entirely free from local anesthetics and other objectionable preservatives.*

PITUITARY LIQUID (Armour) standard strength, is supplied in two sized ampoules, 1cc and ½cc, 6 in a box.

* **Vide Hygienic Laboratory Bulletin No. 109**

ARMOUR AND COMPANY

CHICAGO

1489

ENDOCRINOLOGY:

The BULLETIN of the ASSOCIATION for the STUDY of the INTERNAL SECRETIONS

JULY-SEPTEMBER, 1917

EDITORIAL ARTICLES

CLINICAL ENDOCRINOLOGY

THE important disease-pictures due to disturbances of the internal secretions were recognized by the clinicians as syndromes before their pathological anatomy and physiology were understood. Thus Graves' disease, myxedema, and Addison's disease, were all recognized and described as clinical entities by the clinician before they were known to be associated with disturbances of the internal secretions. Diabetes insipidus has long been known to the clinician, but only recently has it been recognized as a disturbance of the internal secretion of the hypophysis cerebri.

Some of these syndromes probably will be broken up into smaller groups. The syndromes known as Graves' disease may arise from several different lesions of the thyroid gland and possibly from lesions originating outside the gland. Pathological anatomy has already done much and will do more to clear up

the obscurities that exist. The anatomist and the histologist bring us information that may seem dry at the time, but one can never tell how soon it may have great clinical significance and importance. The experimental surgeon, the experimental pathologist, have already done a great deal in the study of these conditions and are still active. Later, the pharmacologist and the chemist began to come to our aid. They showed us how to separate specific substances from these endocrine organs. Now adrenalin and pituitrin are familiar to everyone. In the future we may expect much more from the chemist and the experimental pharmacologists. The chemical constitution of the active substances in the internal secretions will gradually be worked out. Then we shall learn how to synthesize these substances, so that the animal source will become unnecessary.

So, it is very desirable that all those who are interested in the internal secretions,—clinicians, surgeons, pathologists, anatomists, pharmacologists, chemists, —should be bound together in such a way as the "Association for the Study of the Internal Secretions" proposes.

Only by the careful gathering of the facts, and the arranging of these facts according to their similarities and sequences, shall we ever get at the general laws that underlie endocrinology, so that we shall be able to make accurate diagnoses, to prognosticate safely, and gain the power to control. For not only do we desire to be able to understand diseased conditions; we wish also successfully to treat people who are ill, and to prevent people from becoming ill.

REACTIONS OF THE THYROID GLAND TO NOXIOUS AND DIETARY INFLUENCES

AS has long been recognized there is wide variability in the microscopic appearance of the thyroid even within supposedly physiologic limits. It reacts quickly to relatively slight variations of the body metabolism and consequently may show detectable histological changes even daily. Marine and Lenhardt ('09) distinguish as "physiologic" the following: (1) normal resting glands with low cuboidal epithelium; (2) hyperactive glands, with hyperemia, cells becoming hyperplastic and columnar, colloid disappearing; (3) colloidal glands (stage of recovery) in which conditions return to (1) with abundant colloid. In case, however, of over stimulation without adequate rest the colloid disappears and the cells die of exhaustion, becoming progressively degenerated and desquamated and showing various degrees of disintegration. In this case the nuclei are enlarged, often stain densely and vary in appearance. Similar desquamation and degeneration of the epithelium are said to occur in normal senile atrophy. At times the vesicles are small and irregular with projections into their cavities and the lining cells tall columnar. This, the hyperplastic stage, is normally associated with paucity of colloid.

This hyperplasia is commonly regarded as an expression of augmented activity but Marine and Lenhardt regard it as a compensatory reaction, giving an excess of physiologically inefficient secretion. That this interpretation is correct is indicated by the fact that puppies from mothers with hyperplastic glands, at birth have overgrown thyroids, a reaction due,

supposedly, to thyroid deficiency in the maternal blood stream. (Carlson '13.) A similar hypertrophy is observed in puppies from mothers from which a large part of the thyroid is removed. (Halsted, '96, Marine and Lenhardt, '09.)

By the administration of iodin the hyperplastic thyroid can readily be converted to the colloid type. (Marine and Lenhardt, '09, Bensley, '16.) On the other hand Bensley has found that when animals (opossums) captured in a wild state are brought under domestication the thyroids promptly change from the colloid to the hyperplastic condition. This result is supposedly due to change in diet—probably to increased ingestion of protein.

Effects of Diet. Watson ('09) has reported a somewhat extensive investigation of the variations in the thyroids of rats with particular attention to the effects of various diets. Four types of glands were described. In the first the vesicles are large, the colloid normal, and the cells are flattened and have darkly stained nuclei. In the second type the follicles are smaller, the cells cuboidal, with relatively little cytoplasm and with rounded nuclei. In the third type the follicles are small, the cells large with abundant cytoplasm, and the colloid has but slight affinity for stains, a condition which other observers have correlated with dilute consistency. In type four the cells are detached and distorted with pycnotic nuclei and cytoplasm variable in quantity and structure. In forty wild rats three fourths had glands of types I and II. Of these types Jackson ('16) regards I and II as probably due merely to deficient diet while the fourth corresponds to a degenerative type such as has

been recognized by a number of observers as fairly common. Marine regards this type as due merely to autolysis, a process which, on account of the simple architecture of the thyroid, produces changes that are easily recognized. This condition is likely to be seen in any gland in which fixation has been delayed. In a series of twelve rats Watson ('05) studied the effects of an exclusively meat diet. Ten animals showed marked changes in the thyroids such as congestion, degeneration of the follicles and eventually shrinking in the size of the follicles and of the whole gland. These changes were associated with retarded growth, dryness of the skin and falling off of the hair. In another series ('07) ten wild rats were killed as controls immediately after capture and ten were kept for several weeks on a diet of bread and milk. The controls had large colloid-filled vesicles with taller epithelium. As before mentioned, glands similar to both of these varieties may be produced by inadequate diet and the interpretation of the results is correspondingly difficult. In another series ('07) an oatmeal diet was employed for several weeks, at the conclusion of which the thyroids showed marked enlargement. In some cases the cells were swollen and detached.

Douglas ('15) has reported an extensive study of the effects of various diets upon the thyroids of pigeons, chicks, rats and rabbits. He noted glands similar to the various types described by Watson but stated that the histological appearances do not represent different stages of secretion comparable to those of secreting glands engaged in the process of digestion. Under similar conditions and in animals

fed on similar diets the appearances in the thyroid differ markedly. The variation seems to depend to some extent on the nutrition and is thus only in this way dependent on the diet.

Starvation produces a number of changes in the thyroid. On the basis of a review of the literature and extensive investigations of his own, Jackson ('16) states that the epithelium apparently undergoes at first a simple atrophy, which affects the cytoplasm more than the nucleus. The cells become reduced in height with relatively large nuclei. In advanced stages degenerative phenomena (found also to a limited extent in the normal gland) become increasingly evident. The vesicular cells usually are desquamated. The cytoplasm, typically vacuolated in the earlier stages, may become collapsed, deeply staining and more or less homogenous, or may disintegrate, forming an irregular granular mass. The nucleus becomes hyperchromatic, undergoing successive stages of hyperpyknosis, ending in extreme cases in karyorrhexis. Sometimes, however, it undergoes karyolytic changes.

Results very similar to these have been described in the thyroids of subjects that have suffered from severe burns (Valentine, '08.)

When animals are subjected to hemorrhage the thyroids, according to Wanner ('99) undergo characteristic changes. The epithelial cells become flattened, some of them enlarge and acquire a store of intracellular colloid and many of them disintegrate. These appearances were regarded as evidence of enhanced secretory activity but probably should be interpreted as degeneration changes.

The effects of various sorts of intoxication upon the thyroid glands have been studied extensively,—particularly by Roger and Garnier ('00), de Quervaine ('04), and Martini ('13). In cases of acute infection, such as peritonitis or pneumonia, and acute poisoning, as by phosphorus and, possibly, alcohol, changes occur which are regarded by Martini and others as evidence of cell activity whereby the thyroid functions as an "antitoxic" organ. Among these changes are cell proliferation and excessive discharge of colloid. Others regard the changes merely as evidence of toxic thyroiditis,—as essentially degenerative in character. In cases of prolonged subjection to toxic influences in chronic diseases, such as tuberculosis, sclerotic changes in the thyroid have been described.

Despite a great deal of work the essential nature of the functional changes in the thyroid gland under both physiological and pathological conditions remains an open question. As soon as the criteria of secretory and degenerative phenomena are definitely established the whole problem should be exhaustively restudied. In view of the important influence of thyroid secretion upon bodily well being, a clean cut knowledge of all the factors which increase and decrease the functional activity of the gland is greatly to be desired.

THE EXTENT OF THE PRESENT-DAY ENDOCRINE LITERATURE

TO the average non-specialist the magnitude of the present-day literature on the glands of internal secretion is probably not suspected. Even most spe-

cialists, unless they have lately attempted to deal with the literature, would probably underestimate the number of articles recently published. Important contributions are appearing in several languages, scattered through hundreds of medical and scientific journals, books and "proceedings."

Until about 1890 relatively few articles of endocrine interest had been published. A great stimulus to the study of the glands of internal secretion was afforded by the epoch-making work of Brown-Sequard on testicular extracts. Following the publication of his conclusions, investigators everywhere began to study in this field.

In 1912 Biedl, in the second edition of his well-known book, published a systematic compilation of the literature on the internal secretions. He had utilized some 212 printed pages of references, including about 7000 articles, which dealt directly with the endocrine glands. The rapid growth of the literature at this time is evidenced by the fact that during the time that the book was going through the press some fifteen hundred additional articles appeared, necessitating the addition of 41 pages of bibliography. This brought the literature up to 1913. There were then some 8500 titles in Biedl's lists. There is no available record of the number of papers appearing during the period 1913-1916. Judging by the number of articles preceding and following this period, 4000 may be considered as a safe estimate. Despite the unsettled conditions and the handicaps to research throughout the civilized world, there have appeared since January 1, 1916, some 2000 contributions bearing on the endocrine glands. This brings the total

number of articles published up to approximately fifteen thousand, or an average of approximately six hundred articles per year since 1890. The average number recently appearing, however, is over one thousand per year. These vary all the way from the most superficial trash to the most abstruse contributions of the specialist.

A consideration of these facts brings the realization that a continuous, critical, systematic treatment of this voluminous literature is much to be desired. ENDOCRINOLOGY may drop, therefore, into a place already made for it and meet a need that has come to be realized by all who are interested in the various branches of biology and, especially, medical science.

A partial compilation of the nearly two thousand articles which have appeared in the past year and a half has been made in various places, but none approach completeness. "Chemical Abstracts," which is recognized as perhaps the most complete abstract journal in the world, has dealt with some 300 of the articles bearing on the chemistry of the endocrine glands. "Physiological Abstracts" during the same period has included some 500 of them which bear chiefly upon the physiology of the glands. A large number of the nearly two thousand articles have not as yet been abstracted.

Not only is this true, but in no one of the current publications can be found a complete bibliography of them. Of the American bibliographic periodicals, the "Index Medicus" is probably the most complete. Since the end of 1915 this journal has listed some 1100-1200 of the endocrine articles published. The

"Quarterly Cumulative Index" during the same time has listed about a thousand of them. Together these index journals miss the total number published by some 300. These publications besides being incomplete, contain only the reference to the various articles, which oftentimes are in a language unknown to most readers or are in journals inaccessible except to a favored few.

Many individuals during the past few years have voiced objections to the rapidly increasing number of specialized scientific publications. In the face of such figures as these referred to, however, and considering the increasing importance of the subject of endocrinology, it would seem unreasonable to object to a journal devoted to this subject.

The journals on specialized subjects which are now appearing, such as "Brain," "Archives des maladies du coeur, des vaisseaux et du sang," "Archives of Radiology and Electrotherapy," "Journal of Immunology," etc., although some have temporarily suspended publication, have proven a success and developed an inestimable value to those for whom they were originated. ENDOCRINOLOGY should at least do no less.

PRESENT-DAY ENDOCRINOLOGY FROM THE STANDPOINT OF THE PEDIATRICIAN

NO specialist can be more interested in the newest advances of endocrinology than the pediatrician. Cretinism and myxedema with the associated thyroid involvement; spasmophilia and the parathyroids; marked inspiratory stridor and sudden deaths suggestive of thymus involvement; collapse during the

course of an infectious disease, suggestive of adrenal insufficiency; all show how vital to the pediatrician is the study of the internal secretions. But when we turn with aroused interest to the vast literature that has accumulated during the past year, we are disappointed. Cases have been reported with typical symptoms suggestive of some endocrine anomaly, but have not been confirmed by post-mortem examination. Some authors have drawn extravagant conclusions from very few cases. In others, observations, to say the least, may be open to various interpretations; in others the gross methods of experimentation have invalidated the results and, finally, a certain hysteria has seized many writers who now attempt to attribute every pathological condition to some change of internal secretion. Were the whole literature of the past year boiled down and distilled, the residue would contain very few concrete, serviceable facts other than those already named.

We are still in a maze concerning almost every organ. Take the thymus for instance. Every study made has been disputed. Status thymo-lymphaticus is a condition by no means settled, for in the majority of cases data essential to the diagnosis are lacking, such as the weight of the thymus or evidences of status lymphaticus outside of the thymus, itself. The weight of the thymus is extremely variable. In a study of 50 still births, not the subject of status lymphaticus, Schridde found the difference in the weight of the gland at birth varied from five to twenty grams. How difficult then is it to draw conclusions from an X-ray picture for instance or from a study of only one case? Is the thymus a gland with

an internal secretion? We are led by Klose, Vogt, and Matti to believe that this gland secretes a substance essential to life or, if not absolutely essential to life, at any rate very important; for thymectomy produces grave changes with all the findings of rickets and additional extensive lesions in almost all organs. Other observers have denied these conclusions flatly and claim that all the changes found by the first observers were due to the poor hygiene in the kennels. So the battle still is waging.

In view of the conflicting opinions, the work of Hammar stands out strikingly. His carefulness and the saneness of his reasoning force his opinions upon us. His work is almost of mathematical accuracy. He has estimated the exact amount of parenchyma, minus fat and connective tissue, by means of serial sections and reconstructions; and in the same way he has determined the exact relation of medulla to cortex. The Hassall corpuscles, he counted. His first important contribution was to show that enlargement of the thymus in thymic death is by no means constant. In 13 out of 14 cases studied, only two were enlarged. Another very interesting paper is an analysis of the mechanical theory of thymic asthma. Up to recent times, it has been assumed that thymic death may be caused by the thymus becoming wedged between the upper part of the sternum and the vertebral column, exerting pressure upon the trachea. Hammar, in a very striking way, reminds us that the thickest portion of the thymus lies at the level of the base of the heart, considerably below the so-called critical point. Thus, any surgical maneuver of drawing the thymus upward could not possibly relieve the

condition but must actually intensify it. Again, the thymus is not forced upward into the neck with each inspiration but recedes into the thorax; so if it produces dyspnea by compression of the trachea anywhere above its thickest part, it would cause expiratory dyspnea rather than dyspnea during inspiration.

Thus Hammar proves that many of our notions about the thymus gland are false. His anatomical preparations, however, indicate that enlarged thymus may exert pressure upon the trachea close to the bifurcation, or on the bronchi, particularly in a newborn child, whose thymus is relatively much broader than at a later period. He does not commit himself however as to whether the thymus does actually compress the trachea at these points.

Hammar's studies indicate to us what we must demand in the future. What we seek is facts, not theories. Rather a few, definite, concrete truths than volumes of hypotheses. It is only by studies such as these that we can hope to make definite progress.

ORIGINAL COMMUNICATIONS

REPORT OF A CASE OF DYSTROPHIA ADIPOSO-GENITALIS

W. W. Roblee, M.D., Riverside, Calif.

THE case report herewith presented is of interest to the student of hypophyseal diseases for three reasons:

1st. As illustrating the fact that a patient may grow steadily worse symptomatically while under intensive treatment for the primary disease, in this instance syphilis, which is causing or has caused destruction or alteration of the parenchyma of a gland. This patient showed improvement in the clinical syndrome only after feeding of gland extract was resorted to.

2nd. The rather brilliant clinical results secured in this case should give encouragement to us in similar cases.

3rd. In this case, which was quite typical of the acquired Dystrophia Adiposo-genitalis of adults, the results achieved came by the use of anterior gland extract only.

These cases show adiposity, genital dystrophy, irritability, somnolence and usually a disturbance of carbohydrate metabolism as evidenced by a high sugar tolerance. The obesity and genital dystrophy are the presenting symptoms. These cases are not uncommon. In explaining these symptoms, Cushing has taught that the lack of bony development was

due to anterior lobe hypofunction; the adiposity, genital dystrophy and high sugar tolerance to a hypofunction of the posterior lobe. These conclusions must be modified in so far as the genital dystrophy is concerned and probably to some extent with reference to other symptoms. The work of both Goetsch and Robertson has shown conclusively that the development and proper conservation of the genital function cannot be secured without the active assistance of anterior lobe secretion. The fact that large doses of posterior lobe substance will cause emaciation and physical weakness gives reason for supposing that a hypo-function of this lobe will cause the opposite, viz., adiposity. Froelich, Cushing, Fischer and others have ascribed Froelich's Syndrome entirely to a disturbance of the posterior lobe. The operative and post mortem findings in these cases have been quoted as confirming this idea. The facts, however, seem to indicate that the new growth, either by pressure or infiltration, involves both lobes with a consequent uncertainty as to which is responsible for the clinical symptoms. If the feeding experiments of Goetsch and Robertson on rats and mice are to be accepted, they prove that both skeletal and muscular growth and genital development are dependent upon anterior lobe substances, whereas the feeding of posterior lobe extract has a retarding influence. Furthermore, when any considerable portion of the anterior lobe of a young dog is removed, if he withstands the operation he later develops a Froelich's Syndrome, whereas, the removal of the posterior lobe is not followed by any such effect. This is very conclusive evidence and my inclination is to ascribe the entire Syndrome to deficiency of this lobe and I feel

that the effects of glandular administration spoken of by Cushing are to be held as a contradiction which will have to be explained as we learn more of this subject or that there were enough epithelial investment cells in his posterior lobe material to give results.

E. L. S.—age 39; married; father died of cardiovascular hypertension; mother now seriously ill with same symptom complex. Denies venereal history. In 1911 I removed an epithelioma from the lower lip.

In spring, 1914, he developed a growth involving the tongue which was diagnosed in the Howard Kelly Clinic, at Baltimore, as syphilis. He received intensive treatment for several weeks, which included twelve injections of salvarsan and continued the use of K. I. more or less faithfully until he came under my observation again, November 10th, 1915. States that weight until two years ago was 190 to 200. Present weight 334; has been gaining in weight past three years; gained 36 pounds in past few months.

Symptoms: Dyspnoea, sleepiness, drops to sleep during a conversation but unable to lie down much at night on account of dyspnoea. A severe bronchitis is present. Irritable, though formerly of a very even disposition. Genital function failed during past six months and now absent. No erection for two months, penis smaller and retracted. During past year great craving for sweets—has eaten an average of half a pound of candy a day in addition to sugar and sweets at meals. During past year averaged urination every two hours at night and four hours in daytime. Quantity not large.

Urine—½ per cent. albumen by Esbach; otherwise normal. Temperature, 99.6; Pulse, 100, Nov. 28th.

No glycosuria after administration 300 grammes glucose.

Blood pressure—160 Systolic.

Nov. 10th, 1915. Wassermann, positive. Resumed K. I. sat. sol. to be increased to tolerance. Hg. protiodid to tolerance and 30 gr. anterior pituitary gland per day.

Nov. 28th reduced to 27 gr. per day.

Dec. 6, weight 321, not so sleepy in daytime, sleeps better at night.

Jan. 1, weight 317, not so sleepy in daytime, sleeps better at night.

Jan. 17, weight 311½, sleeps from ten to six, well; cough less; can sleep using only one pillow; no sleepiness during day; more energy; dose now 27 gr. per day; complains of slight nausea after last dose of three tablets at night, so advised one less.

Jan. 31, weight 305½, medicine now 40 gtts. K. I., T. I. D. and two ¼ gr. protiodid pills daily; 18 gr. pituitary gland per day divided into three doses.

Feb. 21, weight 303, reports feeling fine.

Mar. 7, weight 300, reports feeling fine.

Mar. 20, weight 300, some mental depression two days; advised to increase K. I. to 50 T. I. D.

Apr. 4, weight 295½, increased K. I. to 1 dr. T. I. D.

Apr. 17, weight 287, some sore throat; advised four 1-gr. pituitary tab. T. I. D.

May 2, weight 287.

May 26, weight 283, reports no dyspnoea, no sleepiness, genital function returned; very slight craving for sweets; reduced pituitrin to 2 tab. T. I. D.; stopped the mercury pills.

Oct. 6, weight 278½, reports everything better.

Apr. 15, 1917, weight 275, feels fine; sleeps well; genital function satisfactory. Atends to business affairs as usual. He is a big fat man but symptomatically well.

DISCUSSION OF THE REPORT OF DR. ROBLEE

Emil Goetsch, M. D., Baltimore: I think it is generally accepted now that the factors of growth and of sex development and function are largely dependent upon the activity of the pituitary body. The posterior lobe, that is including the pars intermedia, its epithelial investment, is concerned in its function with carbohydrate metabolism and with urinary output to a considerable extent. In other words, with pituitary deficiency there is apt to be polyuria, and

high sugar tolerance and with posterior lobe overactivity or after the administration of considerable amounts of posterior lobe the carbohydrate tolerance of the individual is considerably lowered. The urinary output is also reduced in amount. It is interesting to note the rapid loss of weight and the improvement generally and particularly in the genital function after the administration of anterior lobe extract of the pituitary gland. One must be careful in not attributing all the improvement to pituitary feeding for during the same time a very rigid antiluetic treatment was carried out. However, the improvement in the particular symptoms above mentioned is undoubtedly due to the gland therapy.

I am glad to see that the clinical application of our ideas gained from experimental work is being rewarded.

T. Brailsford Robertson, Ph.D., Sc.D., Berkeley: I am especially glad of the opportunity which I have been offered of commenting upon this case because I think that investigations recently carried out in this laboratory by Dr. C. L. A. Schmidt have already placed in our hands the clue to the apparent contradiction to which the author alludes between the fact that the symptoms of Froelich's syndrome point largely to hypo-function of the posterior lobe of the pituitary body and the fact that these symptoms may be successfully combatted by anterior lobe therapy.

The active principle of the anterior lobe, Tethelin, does not exert any of the characteristic actions of posterior lobe extracts upon blood-pressure or upon the isolated uterus. Dr. Schmidt has found, however, that if Tethelin be subjected for a brief period to the action of strong alkaline, then the mixture of the products of decomposition which results has the characteristic effects upon blood-pressure and the isolated uterus which we recognize as those resulting from the administration of the posterior lobe extracts.

Anatomists have long suspected that the posterior

lobe derives its secretion from the decomposition of raw materials supplied by the anterior lobe. The microscopic structure and spatial arrangement of the glands invites such a supposition. The anterior lobe is provided with two methods of distributing its secretion. The one through the agency of an exceptionally rich blood-supply whereby the secretion of the anterior lobe finds its way directly into the general circulation. The other through the agency of intercellular clefts, whereby the secretion of the anterior lobe drains towards the posterior lobe. The posterior lobe being provided with but a scanty blood-supply the secretion which it elaborates from materials supplied by the anterior lobe reach the circulation slowly and in small quantities, while large amounts of the secretion accumulate in the tissues of the gland. Hence, weight for weight posterior lobe tissue is much more physiologically potent than anterior lobe tissue.

We see therefore that excision of or injury to the anterior lobe must be physiologically equivalent to excision of or injury to the posterior lobe as well, since its supplies of raw material are cut off or diminished at the source; and it will be sufficiently clear why anterior lobe therapy alone may in certain cases act remedially upon hypo-function of both lobes.

THE RELATION OF THE ADRENAL GLANDS TO THE CIRCULATION OF THE BLOOD

By R. G. Hoskins, Ph.D., Chicago

(From the Department of Physiology, Northwestern University Medical School.)

IN spite of the publication of a considerable amount of evidence to the contrary the idea persists among various clinical writers that the discharge of adrenin into the blood stream plays a predominant role in the maintenance of the circulation. Some phases of the evidence were presented in articles by Professors Vincent and Stewart in the preceding number of Endocrinology. In the present communication it is proposed to present a few additional facts bearing on the problem and to discuss some recent work on the relation of adrenin to the distribution of the blood.

That the suprarenal glands are stimulated under certain "emergency" conditions to pour out their secretion in significant amounts has been asserted by several investigators of recent years. Cannon in studying the activities of the alimentary tract had noticed that an outburst of fear or anger resulted in a checking of peristalsis. This might well be due to an outflow of impulses through the sympathetic system, a phenomenon that is well known to occur under such circumstances. The investigator was struck, however, by the fact that the depression of peristalsis persisted for some time after all outward signs of emotion had subsided. Adrenin was known to inhibit peristalsis and the suprarenal glands were known to receive sympathetic fibers. It was suspected then that the prolonged depression of peristalsis might be due to an after-discharge of adrenin.

Testing this hypothesis, Cannon and de la Paz

(1) observed that in animals subjected to violent emotion blood collected from the suprarenal segment of the vena cava gave evidence of an augmented adrenin content. Similar results were obtained by Cannon and the writer (2) when anesthetized animals were subjected to vigorous sensory stimulation or asphyxia. In testing for the presence of adrenin segments of intestine were utilized.

More recently Stewart and Rogoff (3) have been unable for the most part to confirm these observations. They have utilized not only the intestinal segment but also the uterine segment and denervated eye tests. In such experiments the incidental trauma admittedly enters as a seriously disturbing factor. Cannon has recently noted, however, that if the denervated heart be used as a test object the trauma factor can be obviated. In a series of researches soon to be published in the American Journal of Physiology he has succeeded in confirming the earlier results. It would seem then to be fairly well established that under emergency conditions the glands play a part in regulating the circulation.

The question then arises: What part do the suprarenals play during periods of ordinary placid existence? A few years ago a satisfactory theory could have been constructed about as follows: An animal deprived of its adrenal glands dies. The blood pressure falls, indicating that the sympathetic system has failed in its function. Injections of adrenal extract cause a marked rise of blood pressure. Therefore, the function of the adrenals is to maintain the tonus of the sympathetic nervous system. This might be designated the "Tonus theory."

The first question that arises when one considers

the theory is this: Is there present in the blood as it leaves the heart enough adrenin to exert any appreciable influence on the nervous system? In the earlier literature occur various statements which indicate that the blood does contain considerable quantities. The concentration is given as, for example, one part in ten millions. But it is interesting to note that as the technique for adrenin determinations has improved the dilution of that substance in arterial blood has constantly approached infinity. The most sensitive of the practicable methods now known is to pass the blood to be tested through the capillary bed of a frog's legs and note the rate of outflow. Trendelenburg (4), a recognized master of this method, has found that the concentration in the blood from the carotid artery of rabbits is at most not more than one part in one or two billions,—a quantity quite without effect in the mammalian circulation, and in Trendelenburg's work the possibility was not wholly excluded that the trace of vasoconstrictor substance found was derived from traumatized blood platelets.

The fact that removal of the adrenal glands is for a relatively long period without effect on blood pressure and that the effect of smaller doses is vasodepression were brought out by Professor Vincent in his article previously mentioned.

In collaboration with McClure (5) the writer tested the tonus theory in another way. If adrenin be injected into a vein at a very small but gradually increasing rate, at first no effect at all is to be seen. Then various changes occur. One of the earliest is depression of intestinal peristalsis. If simultaneous tracings be taken of peristalsis and blood pressure it

is found that the gut is paralyzed before any rise of blood pressure occurs. This observation has been confirmed by Hartman (10). One need not comment upon the futility of an arrangement that could maintain blood pressure only at the expense of gastro-intestinal paralysis. Attractive as the tonus theory was, in the light of all the evidence now available, it is no longer tenable.

But the fact remains: Adrenal extirpation is fatal and the final symptoms include a failure of functions that are under sympathetic control. Elliott (6) has offered the interesting suggestion that a minute quantity of adrenin is necessary, not to stimulate but to maintain the irritability of this system. That is, the terminal neurocellular substance of, say, the pressor fibers, in the absence of adrenin is no longer able to transmit impulses to the vascular musculature. This possibility was also investigated in our laboratory (7). It seemed to us that animals at the point of death such as Elliott worked upon are not capable of giving any very significant information. All sorts of secondary factors might have entered into the experiment. If sympathetic failure is a characteristic feature of the syndrome it should appear at an early stage. It was found that at a time when an animal deprived of its suprarenals was showing marked evidence of that fact,—when it could scarcely sustain its own weight,—its vasomotor system responded to stimulation perfectly well. Vasomotor failure, therefore, is a secondary feature. Both cardiac and muscular weakness precede it.

It would seem probable that if a trace of adrenin is essential to its functioning the reactions of the

vasomotor system should be improved if an animal previously deprived of its adrenals were to receive for a while a continuous infusion of very dilute adrenin. In carrying out such an experiment the surprising fact was noted that such infusions often seriously impede the reaction of the vasomotor system to stimulation. In some cases pronounced block was demonstrated (8). This observation which was confirmed many times both in normal animals and in those deprived of their adrenals would seem to dispose of the theory that circulating adrenin facilitates vasomotor functioning.

The possibility remains that minute quantities of adrenin are necessary for the metabolism of other tissues—for example, as Crile (9) supposes, the brain cells. If such were the case—if adrenin failure were the significant feature in suprarenal deficiency—it should be possible by continuous infusion of adrenin solution to preserve the life of an epinephrectonized animal. As a matter of fact no significant prolongation of life can thus be achieved. Laying all theories aside and facing this single fact one can scarcely escape the conclusion that adrenin deficiency plays no essential part in the Addison syndrome or its laboratory equivalent, experimental suprarenal deficiency. Adrenin discharge is apparently then merely a reserve source for use in emergencies.

But as such it is well worthy of detailed study. The fact that different components of the vasomotor system react differently to adrenin makes it necessary to study the effects of that substance throughout the body. This is in effect to determine the influence of adrenin on the distribution of the blood. Such studies, in fact, are needed in cases of various glands,

on account of their possible broad significance in endocrine biology. Theoretically, any hormone might exercise a profound influence upon body functions by shifting the circulation in favor of one organ at the expense of another. This possibility has received little attention at the hands of investigators.

In a series of studies made in our laboratory in the past two years the effects of adrenin in various organs of the body has been investigated. Similar studies have been made during the same period by Hartman of Toronto (10). Since the results of the two series are in general the same they will not be separately considered.

Effects in the Limb. Hartman has previously shown (11) that when the circulation was restricted to extra-splanchnic areas adrenin in dosages that normally would increase blood pressure had a hypotensive effect. This indicates that some extensive structure—presumably the musculature—had reacted by vasodilatation. The literature bearing upon the point indicated, however, that the limbs ordinarily contract under the influence of adrenin. This fact had been taken to show that vasoconstriction was caused in the skeletal muscle. Our investigations (12) showed that when massive doses are employed such vasoconstriction does occur but with all doses that can be regarded as in any way physiologic such is not the case (13). The limb was first placed in a plethysmograph and volume changes noted. It was found that adrenin in all doses generally causes contraction of the limbs and, hence, predominantly vasoconstriction. Occasionally, however, expansion occurs. Removing the skin from the leg converts the contrac-

tion to expansion. Also it was noted that adrenin in all but massive doses—both pressor and depressor—causes an increase in the venous outflow from muscle. It causes, therefore, a vasodilatation in the muscles. On the other hand the outflow from the cutaneous vessels was diminished, hence adrenin causes vasoconstriction in the skin. It is thought that the vasodilator effect of adrenin in skeletal muscle accounts, at least in part, for its beneficial effect in this tissue.

Effects in the Spleen: It was observed that adrenin in all effective dosages causes in the spleen brief dilatation followed by contraction. Occasionally the contraction is followed by a secondary dilatation after the administration of the adrenin is discontinued. The threshold for reactions in the spleen is lower than that of general blood pressure changes. Occasionally a quiescent spleen is stimulated by adrenin to rhythmic contractions. Adrenin causes a brief increase then a decrease in the rate of outflow from the open splenic veins (14).

Effects in the Kidney: According to our observations (15) adrenin in both pressor and depressor doses ordinarily causes contraction of the kidneys and a corresponding decrease in the venous outflow. One animal, however, showed renodilatation with smaller, and renocontraction with larger doses. The threshold for renal changes and blood pressure changes is about the same.

Various observations in the recorded studies suggest that adrenin causes diuresis when administered sufficiently slowly, by bringing about a dilatation of the renal blood vessels. This theory, our observations as a whole do not support. On the other hand,

they do not definitely exclude the possibility that in a normal unanesthetized animal such may be the case. The situation as regards adrenin diuresis may well be not unlike that as regards pituitrin diuresis. From the fact that pituitrin administered to anesthetized animals often gives a brief polyuria a theory has been deduced and widely held that this substance is a diuretic agent in the normal organism, whereas, as a matter of fact it is an efficient anti-diuretic (16). In view of the evidence (a) that adrenin in doses which cause renocontraction depress urine formation (b) that adrenin administered subcutaneously, and hence absorbed slowly, causes polyuria; and (c) that in anesthetized animals renodilatation has occasionally been noted following the administration of adrenin in high dilutions, or, as a secondary effect when larger quantities were used, the theory is not improbable that in normal animals adrenin in relatively small quantities causes a dilatation of the kidneys. Possibly the matter could be definitely determined by attaching metal guide strips to the poles of the kidneys and then after the animal had fully recovered from the operation, studying the volume changes with a fluoroscope when adrenin was administered in various doses without the use of an anesthetic.

Effects in the Intestine: There was no definite correlation between dosage and volume changes in the intestine but dilatation predominated, especially with larger doses. Often the dilatation was preceded by contraction. In some instances contraction alone occurred. The thresholds for volume changes in the gut and for blood pressure changes were about the same. In some cases enterocontraction coincided

with a rise of blood pressure but there was no constant relation between blood pressure and vascular changes in the intestine. The volume changes in the intestine usually persisted for some time after blood pressure returned to normal, indicating that there are compensatory reflex adjustments among the various organs so that a contraction or dilatation in one is followed quickly by a change of the opposite nature in another and the general blood pressure left practically normal.

Since the blood from the intestines is carried into the general blood stream through the liver, an organ which is itself sensitive to adrenin, the question arose: To what extend did hepatic changes play a part in the reaction of the gut? It was found that shunting the blood directly into the vena cava made no essential difference in the reaction, hence liver changes were a negligible feature. The outflow from a small canulated gut vein was augmented by adrenin in all effective doses irrespective of changes of blood pressure or gut volume. In most cases the augmentation was preceded by a brief diminution (17).

From the foregoing observations it is obvious that adrenin in any general sense is neither a vasoconstricting nor a vasodilating agent. It is one or the other depending upon what vessels are involved. Also in some cases, as in the lungs, the effect depends upon the dosage, diametrically opposite results being obtained with change of quantity. Neither can one generalize to the effect that the splanchnic vessels are constricted while the peripheral vessels are dilated. In the peripheral circulation are included not only the skin but also other less extensive structures that

respond by constriction. The effect of adrenin in such a structure as a limb is a composite one, the limb as a whole either contracting or expanding depending upon whether vasodilatation in the muscle or vasoconstriction in the skin predominates. The fact that muscular tissues form the predominant mass in the trunk and limbs would seem to account for the fact that adrenin passed through the extra-splanchnic circulation causes a fall in arterial pressure.

REFERENCES

1. Cannon, W. B., and de la Paz, D. Emotional stimulation of adrenal secretion. Am. Jour. Physiol., 1911, xxviii, 64.
2. Cannon, W. B., and Hoskins, R. G. Effects of asphyxia, hyperpnea, and sensory stimulation on adrenal secretion. Ibid., 1911, xxix, 274.
3. Stewart, G. N., and Rogoff, J. M. Spontaneous liberation of epinephrin from the adrenals. Jour. Pharm. and Exp. Therap., 1916, viii, 479.
4. Trendelenburg, P. Ueber die Adrenalinkonzentration im Saügetierblut. Arch. f. Exp. Path. u. Pharm., 1915, 154.
5. Hoskins, R. G., and McClure, C. W. The comparative sensitiveness of blood pressure and intestinal peristalsis to epinephrin. Am. Jour. Physiol., 1912, xxxi, 59.
6. Elliott, T. R. On the action of adrenalin. Jour. Physiol., 1904, xxxi, xx.
7. Hoskins, R. G., and Wheelon, H. Adrenal deficiency and the sympathetic nervous system. Am. Jour. Physiol., 1914, xxxiv, 172.
8. Hoskins, R. G., and Rowley, W. N. Effects of epinephrin infusion on vasomotor irritability. Ibid., 1915, xxxvii, 471.
9. Crile, G. W. The kinetic drive. Jour. Am. Med. Assn., 1915, lxv, 2129.
10. Hartman, F. A. Further observations on the differential action of adrenalin. Am. Jour. Physiol., 1917, xliii, 311.
11. Hartman, F. A. Differential effects of adrenin on splanchnic and peripheral arteries. Ibid., 1915, xxxviii, 438.
12. Gunning, R. E. L. Effects of massive doses of adrenin on the (venous) outflow from muscle. Ibid., 1917, xliii, 395.

13. Hoskins, R. G., Gunning, R. E. L., and Berry, E. L. Effects of adrenin on volume and venous discharge in the limb. Ibid., 1917, xli, 513.
14. Hoskins, R. G., and Gunning, R. E. L. Effects of adrenin on volume and venous discharge in the spleen. Ibid., 1917, xliii, 298.
15. Hoskins, R. G., and Gunning, R. E. L. Effects of adrenin on volume and venous discharge in the kidney. Ibid., 1917, xliii, 304.
16. Motzfeldt, K. Experimental studies on the relation of the pituitary body to renal function. Jour. Exp. Med., 1917, xxv, 153.
17. Hoskins, R. G., and Gunning, R. E. L. Effects of adrenin on volume and venous discharge in the intestine. Am. Jour. Physiol., 1917, xliii, 399.

DISCUSSION OF PROF. HOSKINS' ARTICLE

Walter J. Meek, Department of Physiology, University of Wisconsin: Recent detailed studies of adrenalin have put the defenders of the tonus theory of adrenal action decidedly on their guard if indeed they have not been already vanquished. The fact that an animal may endure removal of the adrenals for some time before the vascular symptoms appear although we know adrenalin disappears quickly from the circulation, that neither injection nor infusion of the hormone will relieve the condition even though the vaso-motor reflexes are at the same time apparently perfectly retained, and the fact recently shown by Stewart and Rogoff that an animal may live with the adrenals denervated and no demonstrable secretion, all seem to leave no escape for those who would insist that either because of its direct stimulation or because of its sensitization of the sympathetics a small amount of adrenalin is constantly needed for the maintenanec of systemic blood pressure.

Certain other arguments against the tonus theory do not, however, seem so convincing. That the dilution of adrenalin, if there is any in arterial blood, must be as high as one to a billion need not disprove its pressor action for this amount though unbelievably small is still not so far below the limits in which

we can use definite biological tests. It may be remembered that Pysemsky and Kravkov have detected one part in 250 million in the perfusion of the rabbit's ear. The argument that adrenalin in small doses causes vasodilation does not seem very important, at least to us. Our experience, which now covers a very large number of injections, shows that exceptions must be taken to a literal interpretation of the statement that minimal doses of adrenalin are always depressor in action. That in the cat there is a small dose which will give a pure fall of blood pressure can easily be demonstrated. We have found however that in some of these animals if the dose is further reduced the fall in pressure may be replaced by a rise. In the dog it is almost impossible to find a dose that will give a pure fall in pressure. The so-called depressor dose here gives a rise and a fall as may be readily seen by referring to any of the published curves illustrating it, and if this dose be further decreased it is the fall in pressure, and not the rise, which disappears first. The rabbit apparently acts the same as the dog. Our experience then is that while a depressor dose may be found, or at least a dose showing depressor effects, the minimal effect in the majority of cases is a pressor one. It seems however really to matter little whether adrenalin in minimal quantities is pressor or depressor in view of the fact that different parts of the vascular system react differently to adrenalin and each has its own threshold. Hoskins and his co-workers have been adding valuable data by attacking the problem in the logical way, that is, to find out the effect of adrenalin on each organ separately. The effect of adrenalin on systemic blood pressure is only the algebraic summation of its influence on the different parts of the body.

Granted that the weight of the evidence is against the tonus theory, the energizing and integrating action of adrenalin in times of bodily stress and strain

seems to be its most likely physiological function. Although one may be tempted to question whether adrenalin as an integrator aids the organism in all the many ways pointed out by Cannon and his students, purely on the ground that no other physiological theory ever worked out so happily in all its details, yet enough has been verified to compel us to accept the theory in its broad outlines. It may be even somewhat in favor of the general conception to point out certain discrepancies that appear, as the details are investigated more and more closely. Hartman for example offers evidence that adrenalin causes a peripheral dilation in muscle and a central constriction in the splanchnic area. This mechanism fits nicely into the needs of the body during emotional excitement accompanied by muscular effort. Hoskins and Gunning have, however, reported that on plethysmographing the intestine the minimal effect of adrenalin is generally dilation or a transient constriction followed by vasodilation. Their results we can abundantly confirm from records taken in our own laboratory. This intestinal dilation is possibly passive, due to the relaxation of the circular coat of the intestine and a consequent relief of pressure on the arterioles. It must, however, oppose any increased circulation through skeletal muscle. It is of course quite possible that the advantage of inhibiting the smooth muscle of the intestine more than offsets the disadvantage of this moderate dilation.

From our present knowledge it might be concluded that the constant secretion of adrenalin is not necessary for life. This conclusion can not be secure, however, until we are able to explain why it is that every animal having the adrenals removed sooner or later dies with signs of muscular and circulatory collapse. With a few exceptions, recent workers have ignored the cortical part of the adrenals. It may be that here will be found the solution of the difficulties. Biedl has shown that it is the inter-renal or cortical

part that is necessary in the fish, and Crowe and Wislocki have presented evidence indicating that probably this is the part necessary for life in the dog. Voegtlin and Macht's isolation of a pressor substance from the adrenal cortex, a substance which certainly was not adrenalin but a cholesterin like body, is of particular interest in this connection. One is tempted to form an hypothesis that the adrenals are double organs, the cortex supplying a hormone necessary for life by virtue of its maintaining muscular and vascular tonus, and the medulla supplying a particularly active pressor substance, adrenalin, to be used in times of great emergency, which has remarkable powers of correlating and energizing various organs of the body.

THE VASOMOTOR EFFECTS OF ADRENIN WHEN ADMINISTERED WITHOUT ANESTHESIA

By E. L. Berry, Chicago

(From the Laboratory of Physiology of the Northwestern University Medical School.)

ONE of the more important problems which now confront workers in the field of endocrinology is, what part is played by the adrenal glands in the normal and pathological activities of the body. An important feature in the solution of this major problem is the determination of the exact effects of adrenin on the various functional processes. These having been determined, the problem still remains as to whether the adrenals can and do secrete at a rate sufficient to produce the effects noted. In other words, the quantitative aspects of adrenin research are highly significant. This is particularly true because of the observations that the reaction to an injection of adrenin may vary diametriaclly depending upon the dose administered (Vincent (1), Tribe (2), etc.). We need definite information then as to whether adrenin is actually discharged into the blood; if so, under what condition and in what amounts and finally just what effects are produced by these amounts of adrenin.

Of the available data bearing upon these problems practically all have been derived from anesthetized animals. To what extent observations made upon etherized dogs are applicable to normal men, or even to normal dogs in many instances can not be accurately predicted. The burden of proof rests upon the investigator who wishes to genralize from such data. The whole problem of the pharmacology of adrenin

without the complications of anesthesia is therefore in need of further study. Certain aspects of this problem are now under investigation in our laboratory. A brief preliminary account of the results as regards the vasomotor reactions is herewith offered.

Technique. The work thus far has been done upon dogs and cats. The technique, in the case of the dogs, has been: first, to select animals of quiet temperament. After arranging them comfortably on the animal board 1 mil. of 1 per cent. morphine (1-6 gr.) was injected subcutaneously, then, using cocaine locally, the femoral vein and artery were exposed and canulas inserted. Usually the first dose of morphine was sufficient so that the animal remained quiet during the operation and subsequent manipulations. Occasionally, however, with large dogs the dose had to be repeated. Since morphine is an excitent to cats it was not used; otherwise the technique was the same as with dogs. The arterial canula was connected with a Harvard manometer, using 10 per cent. sodium citrate as an anti-coagulant. The changes in blood pressure were recorded upon a revolving drum. The venous canula was connected with a burette containing normal salt solution. Thus the amounts of solution injected each time were easily regulated. The intravenous injections were made into the tubing connecting the burette with the venous canula, then by opening a clamp they were flushed into the vein. Parke, Davis' "Adrenalin," diluted 1:200,000 was employed in the intravenous injections for all but the smallest doses, for which higher dilutions were used. The reactions to graduated decreasing doses were recorded until the threshold was reached. The ani-

mals were then anesthetized with ether and readings with the same dosages again taken.

Results. One of the most striking features of the research apparent at present is the marked depressing effect of ether anesthesia on the vasomotor reaction to adrenin. In various instances the threshold in the unanesthetized dogs was not reached until doses of 0.0078 to 0.0039 mils. of 1:100,000 were used. In two instances the administration of 0.5 mil. of 1:100,000 drove the mercury out of the manometer so that the connecting tube had to be clamped off.

As an example illustrating the difference in reaction before and after etherization the following specific case may be cited: Cat before etherization, on administration of 0.25 mil. 1:100,000 adrenin gave an increase in blood pressure of 90 mm. Hg., the effect lasting over a period of three minutes, and showing no depressor phase following the rise. After etherization 1 mil. of 1:100,000 solution gave a rise in pressure of only 48 mm. The effect lasted two and one-half minutes and was followed by a slight depressor reaction.

Almost without exception the duration of the effect of the adrenin is decreased from 10 to 30 per cent. by the ether. The type of the reaction is also changed. In only one or two instances have any depressor effects been noted following the injection of adrenin in the unanesthetized animals, whereas such are usually observed when ether is used. The return of the blood pressure to normal is much more gradual in most instances without anesthesia. The vagus action on the heart is frequently pronounced in the normal as compared with the etherized animals. In

some instances the heart was slowed from 130-140 to 60-70 beats per minute following the injection. The force of the beat, however, is often sufficient to cause a change in pressure of from 60 mm. Hg. to 80 mm. Hg. with each contraction. Both of these effects largely disappeared under ether. The fact that the vagus is especially susceptible to ether has been emphasized by Meek and Eyster. (3)

In the experiments so far made oral and subcutaneous injections even in large amounts have produced slight or no effects on blood pressure. One dose of 5 mils. of adrenin given intramuscularly in a cat was followed by a rise in blood pressure of 10 mm. Hg. in five minutes and at the end of twelve minutes it had increased to 28 mm. Hg. This rise in pressure was very gradual.

REFERENCES

1. Vincent, S. Recent views as to the functions of the adrenal bodies. This Journal, 1917, i, 140.
2. Tribe, E. M. Vasomotor nerves to the lungs. Jour. Physiol. (Lond.) 1914, xlviii, 154.
3. Meek, W. J., and Eyster, J. A. E. The effect of adrenalin on the heart-rate. Am. Jour. Physiol. (Phila.) 1915, xxxviii, 62.

COMMENT ON MR. BERRY'S ARTICLE

D. E. Jackson, St. Louis, Mo.: In a very striking manner Mr. Berry has emphasized in this paper the peculiarly uncertain influence which an anesthetic may exercise on the finer details of the pharmacological action of drugs. The depressing influence of ether is demonstrated here in a way in which, under ordinary circumstances, its action is either entirely ignored or at most not sufficiently emphasized. Presumably chloroform would have yielded more (and nitrous oxide less) marked differences in the vascular responses, while ethyl bromide and ethyl chloride

would have given intermediate results. The alkaloidal hypnotics, such as morphine, have been widely used for experimental procedures, especially as a preliminary to ether. It can easily be shown that morphine produces marked changes, both centrally and peripherally, in experimental animals, and the peculiarly involved and complicated influence which such hypnotic drugs may have on the action of other substances is by no means clear. Generally these hypnotic influences have not been considered of special importance.

From a pharmacological standpoint the question would arise at once as to how and where the ether acted in order to lower the animal's vascular responses to adrenalin. A depression of the brain and cord might indirectly tend to lower the general tone of the vascular system and thus reduce the vigor of the heart and of the muscular response of the arterioles, even though the stimulation of these was of peripheral origin. For not only will ether depress the tonic impulses which are normally constantly passing out from the central nervous system to the peripheral structures, skeletal muscles, etc., but the normal rate of oxidations is also lowered in the body by ether anesthesia. This effect on the tissue oxidations is of especial interest in the present instance. For it appears that adrenalin cannot exercise its full pharmacological activity on the sympathetic myoneural junctions unless there be a sufficient supply of available oxygen in the blood and tissues. This problem may, perhaps, be best approached in a spinal animal. In such a preparation, if one brings on a marked asphyxia by reducing the artificial respiration, or by injecting a drug like morphine which causes a profound broncho-constriction and thus indirectly an asphyxia, then the injection of even large doses of adrenalin will produce only a very small rise in blood pressure.

In this reaction the heart and arterioles are ap-

parently both directly concerned. The result is probably very largely due to a direct lack of available oxygen in the blood and tissues, for if the artificial respiration be mechanically increased (in either case) up to the normal, then almost immediately the normal responsiveness of the tissues is regained, and injection of the same sized dose of adrenalin as that which previously caused only a little rise in pressure will now produce a great increase in the vascular tension. But the exact inter-relations existing between the central and peripheral action of the anesthetic, the cause and results of the asphyxia, and the variability in responsiveness of the vascular and other systems to adrenalin injections is a matter of obscurity.

A further point of interest which may be developed from Mr. Berry's paper is this: How long will the depressing influence of ether on the vascular response to adrenalin persist after the animal has ceased to breathe the vapor of the anesthetic? Perhaps one might use a spinal animal to study this point also. In these preparations the actual extent of rise in blood pressure produced by a given injection of adrenalin is apparently pretty close to the result which would be obtained from the same sized dose of adrenalin in the etherized animal before its brain was destroyed. If in the spinal (or decerebrate) animal artificial respiration were carried on long enough, a fairly large percentage of the absorbed ether vapor might be excreted by the lungs and then the responsiveness of the vascular system to adrenalin might again be tried. It is only by such indirect processes as this that such problems as that now in hand can be satisfactorily investigated.

DIABETES INSIPIDUS. A METABOLIC STUDY OF THE EFFECT OF PITUITARY ADMINISTRATION

By John R. Williams, M. D., Rochester, N. Y.

Introduction: The following paper contains:

1. A brief resume of the literature in which most of the recent writers regard the disease as due to hypofunction of the hypophysis.

2. A clinical description of a case in a woman, age 58 years, in which the chief symptoms were thirst; polyuria; pain in head, back, and limbs; impaired eyesight; loss of weight.

3. Physical examination; leucodermic patches on arms and chest, dry skin, body otherwise normal. Patient nervous and irritable.

4. Previous illness negative; family history of cancer, diabetes, and insanity.

5. X-ray examination; sella turcica slightly enlarged, anterior clinoidal processes thin; posterior clinoidal processes thin and of mushroom type.

6. Eyes; concentric contraction of visual and color fields, and other changes suggesting a functional disturbance due to physiological factors.

7. Average amount of urine passed daily when no pituitrin was given (78 days), 6277 cc. Average amount passed daily when pituitrin was given (142 days), 3767 cc.

8. Diets low in carbohydrates, proteins, fats, and salt had little effect on diuresis.

9. Administration of anterior lobe pituitary body by mouth was ineffective in controlling diuresis.

10. Administration of posterior lobe by mouth was also without effect.

11. Removal of spinal fluid to lessen intracerebral pressure diminished diuresis for one day only.

12. The effect of pituitary administration is purely transitory. Its continued use over a period of 8 months has afforded no evidence of permanent improvement.

13. The blood sugar level on a diet rich in carbohydrates was inappreciably influenced by the administration of pituitrin.

14. There was a considerable increase in the cholesterin and fat content of the blood which was uninfluenced by the treatment.

15. The study of the urine excretion by means of the Mosenthal two hour renal test showed that when pituitrin is not given the kidneys eliminate large and variable amounts of urine during the day and an even greater amount during the night period. The percentage of solids or specific gravity is fixed on a low plane and fluctuates very little. When pituitrin is administered, much less urine is excreted during the day periods but the night amount is quite as large as in the previous test. The percentage of concentration of solids in the urine is much greater and more variable. Without pituitrin, nitrogen elimination was quite variable during the day with a pronounced response to the noon meal although the percentage of concentration was fixed during all but two of the periods. The administration of pituitrin seemed to stimulate nitrogen excretion during the latter part of the day and during the night, more than half of it being eliminated during the night hours. Salt elimination is also on a higher plane after the administration of pituitrin.

When pituitrin is not given, salt elimination is on a low plane, there being quite a well-marked fixation of concentration. When pituitrin is administered, both the amount and the percentage of concentration vary considerably, showing that the kidneys have a greater amplitude of function. As in the case of water and nitrogen, more than half of the salt is eliminated during the night hours.

16. The blood creatinin was normal. The urea content of the blood was normal but the rate of excretion was apparently improved by the administration of pituitrin, as evidenced by the lower Ambard coefficient.

Resume of recent literature. Many writers have reviewed the literature relating to the hypophysis. In this paper no attempt will be made to do more than call attention to the views of recent students of the subject with reference to the relationship of the pituitary body to diabetes insipidus, in so far as therapeusis is concerned. In the first and second issues of this journal will be found abstracts of practically all the literature of value that has been published recently. From these reviews have been epitomized the following notes which have a bearing on the case studied in this paper.

Boyd reports a case of glioma constricting the infundibulum of the pituitary body which he believes supports the theory that the secretion of the posterior lobe of the pituitary body passes by the way of the infundibular stalk into the third ventricle. Hoppe-Seyler reports a case in which he brings out the following salient points: "Polyuria from excessive ingestion of fluid is differentiated by the specific grav-

ity remaining low, independent of the amount of food or drink taken. The polyuria is controlled by the vasomotor nervous system and not by the disturbed kidney cells. The prompt reaction of the body to small doses of pituitrin results in the normal excretion of urine, saliva, and sweat. In the case of the urine there is a rapid rise in the specific gravity and

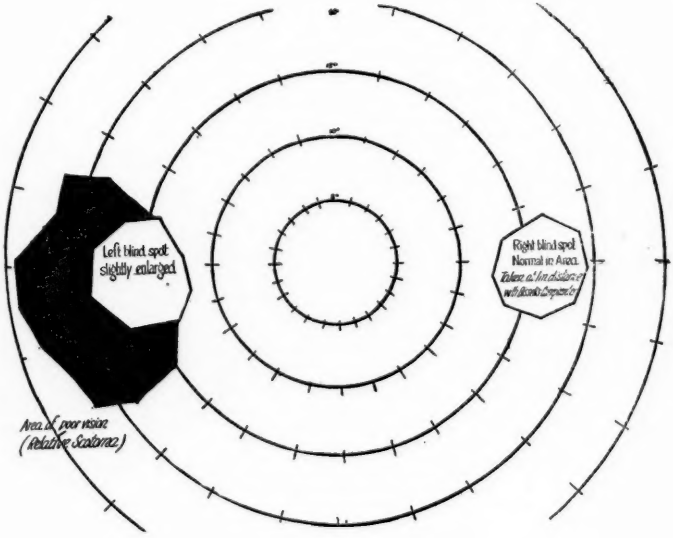

FIG. 1

Chart showing visual fields in the case reported (see page 321).

salts. Insufficiency of the pituitary gland is the cause. All signs rule against the opinion that the disease is due to irritation of the gland or hyperfunction." Hoppe-Seyler refers to work of Magnus and Schafer who conclude that there is a hyperfunction of the hypophysis. Romer showed by animal experimentation and clinical study that there is a hypofunction.

v. Konschegg, E. Schuster, and Graul, from clinical studies, conclude that there is hypofuntcion. Rosenfeld found oral administration of pituitrin as effective as injection.

Motzfeldt (Journal of Experimental Medicine, 1917, 25, 153) has shown that pituitrin does not influence the polyuria caused by the excessive ingestion of salt. He also shows that extracts of the pars intermedia and posterior lobe of the hypophysis, when given by mouth, subcutaneously, or intravenously, have an anti-diuretic effect on experimental animals. Extracts of the anterior lobe have a similar effect but to a lesser degree. The anti-diuretic action exerted by pituitary extracts on experimental animals is caused by stimulation of the sympathetic nervous system and the renal vasomotor system in this respect is of chief importance.

HISTORY OF AUTHOR'S CASE:

Patient is a widow, age 58 years, American born. Complains of excessive urination, thirst, pain in left side of head, tired feeling, pain in limbs, lower back, and distress in epigastrium; dryness of throat.

The illness began in the summer of 1911 with thirst and excessive urination and gradual loss of weight. Lips were dry and cracked, and healed with difficulty. Eyes ached much of the time. When the polyuria first began, the patient had peculiar spells as though she were sinking through the floor. These phenomena she ascribes to severe constipation from which she suffered at the time.

Urinary history. During the day, she urinates from 8 to 10 times, voiding from 4000 cc. to 6000 cc.; during the night, she urinates from 4 to 5 times, passing from 2000 cc. to 4000 cc.

Edema. Formerly, patient thinks eyes were puffy; there is no evidence of edema now. There is no cough or pallor.

Patient suffers daily from headache on left side and back of head; is dizzy nearly every day. Vision is gradually failing. No specks or light flashes before eyes. Complains of stiffness and lameness in limbs, but joints do not swell or become inflamed. Bowels are constipated; takes mild ca-

tharsis daily. Sleeps well except when disturbed by diuresis.

Weight. In 1896, 168 pounds; 1911, 150 pounds; 1916, 131 pounds; October 23, 1916, net weight, 118 pounds; April 9, 1917, net weight, 129 pounds.

Married 34 years. Pregnant twice; no abortions.

Previous illness. Measles, whooping cough, mumps, and scarlet fever as child; good recoveries. Pneumonia at 29 years, again at 32 years, with good recoveries. Had much trouble with teeth and all were removed except lower incisors which are in fair condition. Has been moderately nervous since illness began; is not hysterical and does not suffer from motor excitement. Is troubled somewhat with hemorrhoids.

Family history. Father died at 72 years of liver disease; had cancer on his nose. Mother died at 75 years of heart disease. One sister died of cancer; one paternal cousin died of diabetes mellitus, and two paternal uncles died of insanity. Patient has two living, healthy, adult children.

Physical examination. Patient is a middle aged woman, medium height, thin, pale, worried expression. Face, arms and chest blotched with large leucodermic patches. Skin is dry and elastic. Subcutaneous fat thin, muscles moderately developed. Hair, eyes, ears, nose, normal. Tonsils small, cryptic, no evident degeneration. Tongue slightly swollen and edematous. Thyroid normal; no evident thymus, lymph glands all normal, arteries, soft; no abnormal sclerosis. Blood pressure, systolic 115 mm., diastolic 70 mm. Veins normal. Lungs, normal resonance and breath sounds; no rales. Heart normal in size, rhythm regular, no bruit. Abdomen slightly pendulous, muscle wall flaccid. Aside from a slight tenderness on deep pressure in the region of the gall bladder, nothing abnormal is to be noted in the abdomen. Reflexes, pupillary and patellar both active. Romberg's sign negative. Coordination and tremor normal. Limbs, spine, and pelvis, normal. No evidence of edema.

Teeth, upper plate; lower molars removed; lower incisors normal except one which shows slight pyorrhea. Weight, 118¼ pounds.

Laboratory Examinations:

Blood. October 26, 1916: Red cells, 4,500,000; white cells, 7,600; Hb. 85 per cent.; Hb. index, 94.

Wassermann Test. October 31, 1916, negative.

Non-protein nitrogen in blood, 23 mg. per 100 cc.

A large number of urine examinations were made. The specific gravity was usually low, ranging from 1004 to 1013. Neither sugar nor albumen was found. Several microscopic examinations of the urine were negative.

Functional tests of the kidney were made October 30, 1916. Phthalein, 2 hours, 42 per cent.; November 5, 1916, Phthalein, 50 per cent.

Study of urinary excretion under various conditions. From October 23 to October 30 inclusive, patient voided from 5,500 cc. to 7,100 cc. daily, averaging approximately 6,500 cc. daily. On October 29th, 20 cc. spinal fluid were removed, after the suggestion of Dr. Dean Lewis. The fluid was normal in appearance and cell content. On October 30th the urine dropped to 3,600 cc. but on the two following days, it rose to over 5,000 cc. The effect of pituitrin hypodermatically was then tried. The results of this are shown in the following summary.

TABLE I

EFFECT OF PITUITRIN ADMINISTERED HYPODERMATICALLY ON OUTPUT OF URINE

Date	Vol. Urine cc.	Sp. Gr.	Pituitrin hypo. cc.	Diet Carb. g.	Prot. g.	Fat g.	Calories	Remarks
Nov. 2	2375	1007	1	50	40	48	790	No thirst
3	5850	1006	0	59	44	64	950	Severe thirst
4	1100	1011	2	53	44	72	1025	No thirst
5	1075	1013	1	73	62	68	1150	No thirst
6	3900	1005	1	74	63	78	1255	No thirst
7	1700	1010	1	74	63	78	1255	No thirst
8	2725	1009	1	74	63	78	1255	No thirst
9	2025	1010	1	61	50	107	1338	No thirst
13	3800	1008	1	125	67	106	1705	No thirst
14	2600	1008	2	109	51	91	1438	No thirst
15	1375	1011	1	116	70	116	1660	No thirst
22	3120		2	Diet approximately the same				No thirst
23	3100		2	Diet approximately the same				No thirst
24	4340		2	Diet approximately the same				No thirst
25	3840		2	Diet approximately the same				No thirst
26	3840		2	Diet approximately the same				No thirst
27	3360		1	Diet approximately the same				No thirst
28	4800		6 grains pituitary body (Armour) by mouth					Severe-thirst
29	6960		6 grains pituitary body (Armour) by mouth					Severe-thirst
30	6960		6 grains pituitary body (Armour) by mouth					Severe-thirst
Dec. 1	5520		6 grains pituitary body (Armour) by mouth					Severe-thirst
2	6960		6 grains pituitary body (Armour) by mouth					Severe-thirst
3	6960		6 grains pituitary body (Armour) by mouth					Severe-thirst
4	7000		6 grains pituitary body (Armour) by mouth					Severe-thirst
5	7720		6 grains pituitary body (Armour) by mouth					Severe-thirst
6	7300		1-10 grain pituitary body post. lobe by mouth					Severe thirst

TABLE I (continued)

	7	7000	1-10 grain pituitary body post. lobe by mouth — Severe thirst
	8	7000	1-10 grain pituitary body post. lobe by mouth — Severe thirst
	9	6800	1-10 grain pituitary body post. lobe by mouth — Severe thirst
	10	7000	1-10 grain pituitary body post. lobe by mouth — Severe thirst
	14	6400	1-10 grain pituitary body post. lobe by mouth — Severe thirst
	19	5800	1-10 grain pituitary body post. lobe by mouth — Severe thirst
	23	5900	1-10 grain pituitary body post. lobe by mouth — Severe thirst
	24	2800	1 cc. pituitrin per hypo. — No thirst
	25	3000	1 cc. pituitrin per hypo. — No thirst
	26	2900	1 cc. pituitrin per hypo. — No thirst
	30	2800	1 cc. pituitrin per hypo. — No thirst
Jan.	1	1700	1 cc. pituitrin per hypo. — No thirst
	2	2850	1 cc. pituitrin per hypo. — No thirst
	3	4850	1 cc. pituitrin per hypo. Patient has "cold"
	5	5450	1 cc. pituitrin per hypo. Patient has "cold"
	5	5100	1 cc. pituitrin per hypo. Patient has "cold"
	14	5700	1 cc. pituitrin per hypo. Patient has "cold"
	29	3900	1 cc. pituitrin per hypo. — No thirst
	30	3800	1 cc. pituitrin per hypo. — No thirst
	31	6800	0 — Severe thirst
Feb.	1	6300	0 — Severe thirst
	2	6400	0 — Severe thirst
	3	7800	0 — Severe thirst
	6	5500	0 — Severe thirst
	7	3300	1 cc. pituitrin per hypo. — No thirst
	8	3400	1 cc. pituitrin per hypo. — No thirst
	9	3100	1 — No thirst
	10	2600	1 — No thirst
	17	3100	1 — No thirst
	18	5100	1 — Ate candy freely
	19	4200	1 — No thirst
	21	3500	1 — No thirst
	27	6900	0 — Severe thirst
	28	7100	0 — Severe thirst
Mar.	1	7800	0 — Severe thirst
	4	5450	0 — Severe thirst
	5	7800	0 — Severe thirst
	6	4000	1 — No thirst
	8	3800	1 — No thirst
	12	3200	1 — No thirst
Apr.	10	3700	1 — No thirst
	12	6000	0 — Severe thirst
	14	7100	0 — Severe thirst
	15	5200	1 — No thirst
	16	2800	1 — No thirst

Comment. It will be noticed that pituitrin administered hypodermatically appreciably lessened the urine output. One cubic centimeter was quite as effective clinically as were two

doses. Pituitrin by mouth had no antidiuretic action in this case.

TABLE II

TWO-HOUR RENAL TEST, APRIL 5, 1917

Diet: Carbohydrate 293 grams. Protein 85 grams. Fat 125 grams. Calories 2641. Salt approximately 5 grams. No pituitrin administered.

Hours	Fluid Intake	Urine cc.	Specific Gravity	Nitrogen Grams	Nitrogen Per Cent.	Salt Grams	Salt Per Cent.
7-9 a.m.	300	250	1006	0.53	0.21	0.30	0.12
9-11 a.m.	540	100	1008	0.24	0.24	0.08	0.08
11-1 p.m.	720	300	1007	0.66	0.22	0.18	0.06
1-3 p.m.	810	550	1007	2.15	0.39	0.33	0.06
3-5 p.m.	0	500	1007	1.55	0.31	0.10	0.02
5-7 p.m.	900	350	1008	0.91	0.26	0.21	0.06
7-9 p.m.	60	200	1009	0.55	0.22	0.15	0.06
9 p.m.-7 a.m.	2040	3150	1007	4.73	0.15	1.88	0.06
Totals	**5370**	**5400**		**11.32**		**3.23**	

Summary. The excretion of urine is variable during the day, but there is considerable storage and elimination during the night. There is no evidence of fixation of elimination of water. The specific gravity is so constant as to suggest fixation of concentration of solids. The amounts of nitrogen eliminated during the daylight hours vary widely, suggesting an absence of fixation; there is considerable storage, however, for nearly half of the nitrogen is eliminated during the night. The percentage of concentration of nitrogen shows more tendency to fixation. The elimination of salt is on a low plane and, as in the case of the water and nitrogen, there is evidence of delay and elimination during the night. There is noticeable evidence of fixation of percentage of concentration and probably also of some salt retention. The response to the noon meal is fairly prompt in water, salt, and nitrogen.

TABLE III

TWO-HOUR RENAL TEST, APRIL 9, 1917

Diet: Carbohydrates, 300 grams. Protein, 85 grams. Fat, 119 grams. Calories, 2615. Salt, approximately 5 grams. 1 cc. pituitrin administered hypodermatically.

Hours	Fluid Intake	Urine cc.	Specific Gravity	Nitrogen Grams	Nitrogen Per Cent.	Salt Grams	Salt Per Cent.
7-9 a.m.	0	450	1006	0.59	.13	.63	.14
9-11 a.m.	360	44	1025	0.43	.98	.38	.86
11-1 p.m.	90	64	1025	0.72	1.12	.60	.94
1-3 p.m.	510	42	1025	0.55	1.26	.24	.58
3-5 p.m.	90	100	1020	1.03	1.03	.54	.54
5-7 p.m.	0	175	1014	1.43	.82	.28	.16
7-9 p.m.	1230	300	1011	1.50	.50	.42	.14
9 p.m.-7 a.m.	0	3110	1007	6.61	.21	3.11	.10
Totals	**2280**	**4325**		**12.86**		**6.24**	

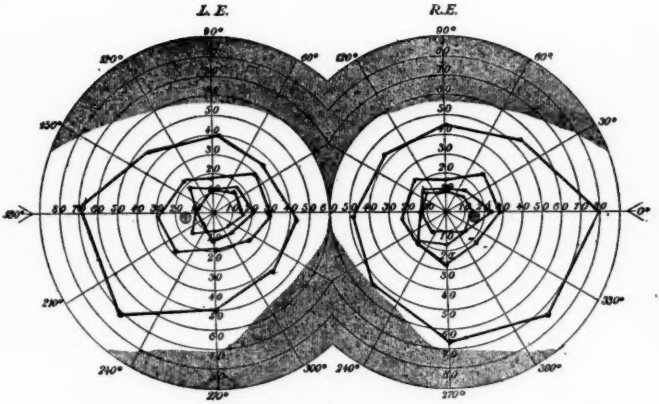

FIG. 2

Chart showing examination of visual and color fields, made February 9, 1917. The outer line is the boundary of the visual field. The next lines enclose the blue, red, and green color fields in the order named. Note the concentric contraction of both the visual and color fields.

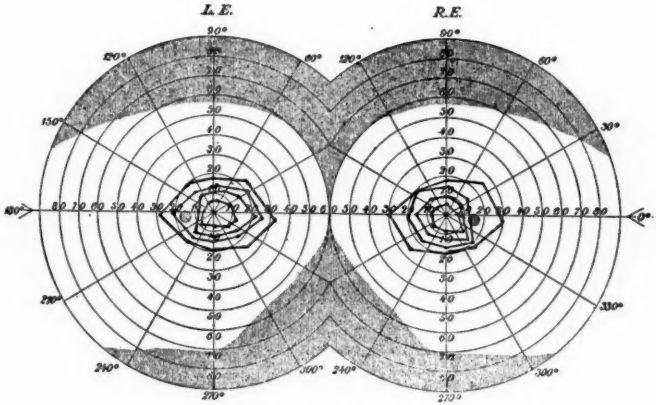

FIG. 3

Chart showing examination of visual and color fields, made July 17, 1917. Note the concentric contraction of both the visual and color fields which has occurred since the previous examination.

Summary. The elimination of water during the day is quite variable. It is on a much lower plane during the day than during the night when there is a noteworthy polyuria. There is little response to the noon meal. The specific gravity likewise fluctuates widely and is much higher than in the previous test. The elimination of nitrogen is normal as to quantity when compared with the protein intake; during the daylight hours, however, it is on quite a low plane, showing a moderate degree of fixation of amount and percentage, although there is considerable fluctuation in the daylight hours. As in the case of the water, more than half of the nitrogen is eliminated during the night. The response to the noon meal is much delayed. The elimination of salt is also on a low plane during the daylight hours, half of it being excreted during the night. There is little response to the noon meal. The percentage of concentration fluctuates considerably. It is noteworthy that the thirst of the patient varies in intensity during the day, the desire for fluid occurring chiefly at breakfast, dinner, and after supper, with none during the night.

Comment on the two-hour renal tests. It seems likely that the administration of the pituitrin assuages the thirst because during the first test when no pituitrin was given, the patient drank large quantities of water throughout the entire 24 hours, whereas during the second test, the effect of the pituitrin evidenced itself chiefly at meal hours and not at all during the night. Excretion of water, nitrogen, and salt apparently takes place continuously throughout the twenty-four hours, but apparently there is delay in excretion or storage of these materials so that night elimination is quite equal to that of the day. This is wholly unlike that of the normal kidney which eliminates quite promptly and efficiently the materials ingested during the day, so that the entire night urine may contain but little more water, nitrogen, and salt than any of the day two-hour periods. It is quite possible that the excessive thirst and the consequent ingestion of large quantities of fluid exhibited in this disease tend to exhaust the kidney rather than to produce a specific lesion. The absence of nitrogen retention in the blood, the normal nitrogen elimination in urine and nitrogen equilibrium in this severe case indicate that the disturbance is not one of faulty nitrogen metabolism or elimination. The same may be said of the salt although it would seem that salt and nitrogen excretion are stimulated by the pituitrin. The normal blood sugar and absence of glycosuria in diets containing large amounts of carbohydrate food, much of it in the form

of sugar, prove conclusively that there is no disturbance of carbohydrate metabolism and that the kidneys have the normal degree of resistance to the passage of sugar. The absence of albumen and renal elements is further evidence that the kidneys are not structurally diseased. It is possible that the improvement in renal output after the administration of pituitrin is partly explained by the rise in blood pressure which follows, although this is denied by some investigators.

TABLE IV

CHEMICAL STUDIES OF BLOOD AND URINE

With and without the administration of pituitrin hypodermatically.

		Blood					Diet					
Date	Vol. urine cc.	Cholesterol mg.	Fat mg.	Non-prot. nitro. mg.	Pressure Syst.-diast.	Sugar	Carb.	Prot.	Fat	Fluid Intake	Calories	Pituitrin cc.
Apr. 3	7100						297	85	122	4500	2670	0
4	6250	312	835	36	110-80	0.10	292	75	112	3180	2572	0
6	3000						300	85	125	2940	2670	1
7	2900						295	84	125	2160	2655	1
8	4075	312	906	36	140-75	0.08	300	85	119	2130	2615	1

TABLE V

		Plt. cc.
June 27	Urea in blood 25.2 mg. per 100 cc.	0
June 28	Urea in blood 40.6 mg. per 100 cc. Ambard Coeff. 0.16	0
June 29	Urea in blood 25.4 mg. per 100 cc. Ambard Coeff. 0.11	1
June 29	Creatinin in blood 2.3 mg. per 100 cc.	

Comment. The samples of blood were taken before breakfast after the night's fast. Cholesterol and blood fat were determined by Bloor's method; the non-protein nitrogen by Folin's micro-kjeldahl method; the blood-sugar by the Lewis-Benedict method. Normal blood rarely contains more than 250 mg. cholesterol per 100 cc. This patient exhibits a well marked cholesterinemia, both before and after the administration of pituitrin. Normal blood of a fasting patient rarely contains more than 600 mg. fat per 100 cc. The blood fat in this case is increased. The non-protein nitrogen in the blood in this case is normal, both before and after the administration of pituitrin. There is no evidence of nitrogen retention. The blood pressure, both diastolic and systolic, are increased by the administration of the pituitrin. On the days when the patient had no pituitrin, twice as much water was drunk as when it was given. The fluid intake is a measure of the patient's thirst. The carbon-dioxide content of the

alveolar air was 41 mm. (barometric tension) before and 39 mm. after the administration of pituitrin. These figures are normal and show that acidosis is not a factor in the disease.

Examination of eyes by Dr. Elmer J. Bissell, February 12, 1917. "Patient has a moderate amount of hyperopia and astigmia, and slight incipient cataracts which are not of the type found in diabetes mellitus. Retinal arteries slightly tortuous. Visual and color fields somewhat contracted. Surrounding the outer area of the blind spot in the left eye, there is a relative scotoma. These tests would indicate that there are some changes in the optic nerve fibres which are not yet discernible with the ophthalmoscope." Patient was re-examined June 17, 1917, and the following changes noted:

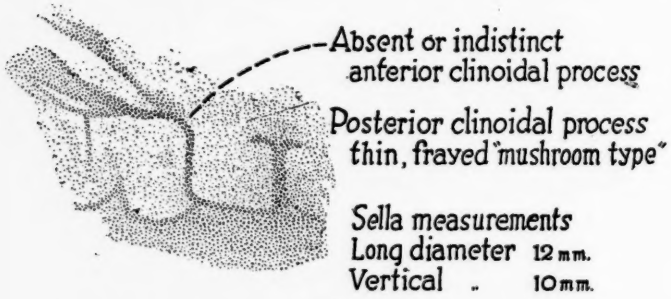

FIG. 4

Sella turcica. Drawing made from tracing of X-ray plate. Note the indistinct anterior clinoidal process and the thin dorsum sella and mushroom type of posterior clinoidal process. The measurements would indicate that the sella turcica is slightly larger than normal.

"No increase in the incipient cataracts. The retinal arteries are slightly attenuated and the temporal side at each optic disc is paler than normal. Visual fields for form and color are very much contracted concentrically. The relative scotoma which was present in the region of the blind spot of the left eye in February has disappeared. This is quite significant and may indicate that some physiologic condition is influencing the function of the retina without producing structural changes. The same condition may be the cause of the contracted visual and color fields."

Report of radiologist, Dr. M. W. Palmer. "The X-ray findings of the sellar region in this case, except in one or two important particulars, do not differ essentially from many other cases in which there is no history of diabetes insipidus. There are, however, certain markings which should not be

overlooked in future examinations of the sella turcica in this disease."

Stereoscopic plates were employed. Dimensions, long diameter of the opening, 11 mm., vertical diameter, 10 mm.

The anterior clinoidal processes are indistinct or absent. The posterior clinoidal processes are also thin. The dorsum sella is about 2 mm. thick; at the top it branches anteriorly and posteriorly into frayed edges to form the posterior clinoidal processes. This peculiar mushroom type is rarely seen except where the posterior lobe of the hypophysis is involved, therefore the absorption of the dorsum sella and posterior clinoidal processes should be considered in the interpretation of plates in this disease.

A CASE OF ADDISON'S DISEASE, DIAGNOSED AS SUCH AND VERIFIED BY POST MORTEM

By Gustav Baar, M.D., F.A.C.P., Portland, Ore.

ON February 22nd, 1917, Mr. Charles Smitt, a Swede by birth, 45 years of age, steam-fitter by occupation, came to my office for examination; he was supposed to have stomach trouble. He complained of needle-like pains coming and going like lightning in the region of the right rib arch, feeling those pains mostly in the nighttime, though several times also in the daytime; he had no appetite the last four months and his bowels moved only on a cathartic and they were merely watery movements mixed with gas, without any pain; several times some blood was present. He had some protruding but not bleeding hemorrhoids. He complained also of flatulence relieved by bowel movement. The onset of his stomach trouble he thought was his "seasickness" he suffered from when coming down from Alaska to Seattle four months ago. He gradually got weaker and weaker and lost twenty-five pounds in weight. He noticed that his skin was getting brownish all last winter, could not sleep at night, was dyspnoic on exertion, felt needle-like pains in his limbs at times, admitted quite a bit of sore throat. About his habits he admitted moderate use of alcohol up to two years ago, when he discontinued its use entirely. For thirty years he chewed tobacco, swallowing the juice, but had to vomit it, so discontinued its use four months ago. He also admitted a hard chancre on the dorsal side of the sulcus coronarius about nine years ago; it stayed there hard for one

year; no secondaries or tertiaries. Eight months ago he contracted a soft chancre from a squaw, "cured" it with hydrogen peroxide, but it came back two or three times, the last time three weeks ago. This is the history of the case.

Physical Examination:

Color of Face: Pale, brownish, diffuse pigment spots on forehead, cheeks and temples.

Color of Lips: Rather pale, with three black pigment spots.

Gums: Pussy, easily bleeding. (The dentist, Dr. Kelty, pronounced this an "interstitial condition due to a faulty elimination of either the kidneys or liver, his gums having become eliminating organs for some of the waste products of metabolism.")

Pharynx: Kryptic follicular tonsils.

Tongue: Clean. Mucosa of both cheeks showed symmetric areas of black pigment, located corresponding to interspace of tooth rows of same color as pigment spots on lips.

Thyroid Gland: Not enlarged.

Lungs: Relative dullness on the posterior superior left apex of chest, distant respiration there; over left apex, posteriorly, inspiratory bronchitic rales; anteriorly on the right side of thorax between sixth and ninth ribs and between mamillary line and sternum edge, the skin appears elevated, round, fluctuating, very tender (seat of the needle pricking pain of which patient complains "in his stomach"). He noticed this swelling for one month.

Heart: Nothing abnormal; pulse easily repressible.

Abdomen: Nothing abnormal palpable.

Liver: Dullness, in front, starting on 5th rib in mamillary line and 6th (!) rib in axillary line: liver edge dull, very tender.

Kidneys: Not palpable.

Skin: Ashy color; on the neck many lentil-sized white scars from boils which patient had all his life (acne and furuncles).

Genitals: Head of left epididymis shows a pea-sized node, hard, tender; the prostate in the pole of the left lobe shows a bone-hard bean-sized tumor; in the sulcus coronarius of the dorsal penis a bean-sized white scar, seat of a former ulcus durum.

Hands and finger nails cyanotic and cold.

Glands: Bilateral nuchal glands palpable; also epitrochlear, very small axillary and inguinal.

Reflexes: Both patellar exaggerated; pupillary to light normal.

Fundi: Right papilla hyperemic, indistinct border line; left papilla normal.

Nose: Left middle turbinate covered with dry mucus.

Ear Drums: Left meatus clogged with cerumen; both drums normal appearing.

Coloscopy: Instrument introduced 25 cm. with patient in knee-chest position; end of instrument palpable on left ribarch; small hemorrhoidal nodules on sphincter ani; nothing else abnormal on linings.

Clinical Examination:

Ewald test (60 minutes, rice and raisins 12 hours previous): quantity, two ozs.; reaction, acid; color, yellow; odor, bready; layers, wash water contains ¼ oz. sediment of fine bread and mucus; no rice or raisins. Free Hydrochloric Acid: Congo red test: very positive. Gunzburg test: very positive. Total Free Hydrochloric Acid: 34. Total Acidity (Titration): 46. Achroodextrin: absent. Erythrodextrin: considerable. Amylum: mostly. Saccharomyces cerevisiae: moderate. Starch Bodies: sufficient Rhexis, mucus.

Blood Test Findings:

Wasserman Test: negative. Hemoglobin, 75 per cent. (Talquist); Polynuclear, 60 per cent.; Small Lymphocytes, 19 per cent.; Large Lymphocytes, 3 per cent.; Transition, 9 per cent.; Eosinophile, 1 per cent.; Basophiles, 1 per cent.; Myelocytes, 7. (!)

Feces Examination:

Color, light yellow; consistency, liquid; parasites, absent; muscle particles, moderate, rectangular, in some striation visible; connective tissue, absent; enthelminth-ovula, absent; protozoa, absent; fat-acid crystals, absent, on adding glacial acetic acid and heat a very few fat globuli; carbohydrates, a few, iodin positive, amylum bodies, extra and intracellulose; reaction, alkaline; benzidine test, negative; fermentation test, 25 per cent.; fermentation reaction, slightly acid.

The patient was put to bed and ran a temperature every day, in the morning 99 degrees and in the afternoon 101½ degrees; the pain in right fluctuating abscess exacerbating in the nighttime; he complains also of pain in night in the upper right lumbar region. (!)

On March 6th the abscess was incised over the

right rib arch by Dr. Joseph Sternberg; the pus on guinea-pig inoculation proved to be tubercular; about one cupful was emptied and the cavity drained; the fever disappeared but patient feels very weak and drowsy most of the time; vomits frequently; visibly emaciated; hypodermics of adrenalin 10 drops a day and inunction treatments having no effect whatever upon the progress of the disease.

Exitus: March 20th, 1917.

Diagnosis: Basing my view of the case upon the peculiar color of theskin, the pigmentation on his lips and cheek linings, the extreme muscular weakness, the finding of apparent tubercular nodule in the prostatic lobe, as well as the apex of the left lung, and the tuberculous pus evacuated from the cold abscess over the right rib arch, I made the diagnosis of tuberculosis of the suprarenal glands, or, as the case is commonly called, "Addison's Disease."

Necropsy by—Drs. Menne and Benson.
Name—Mr. Charles Smitt; age, 45.
Physician's name—Dr. Gustav Baar.
Examined by—Dr. Baar.

Clinical Diagnosis—Tuberculosis of the Adrenal Glands, or Addison's disease.

Anatomic Diagnosis—Fibro-caseous tuberculosis of the suprarenal glands with cold abscess formation about the upper pole of the right kidney; tuberculous lymphadenitis of the glands about the abdominal aorta; tuberculous prostatitis; bilateral tuberculous epidiymitis; localized acute conglomerate and miliary tuberculosis in the apex of the left lung; tuberculous abscess of the right costal cartilage; moderate bronzing of the skin; dry skin; general emaciation and anemia; serous atrophy of adipose tissue.

This is the emaciated body of a white man about 45 years of age. The head is covered with brownish black hair, streaked with gray. There is a mustache of similar color and similar hair is found on chest, axillae, abdomen and pubes. There is general emacation; the eyes are sunken and rigor mortis is present. Body heat is still present.

On the right side at the level of the eighth rib, in the mid-clavicular line, is an incision 3 cm. long, showing ulceration and containing a slight amount of pus and hemorhrage.

In the usual midline incision, the subcutaneous fat is 2.5 cm. thick, is light yellow and is thickest at the navel. Beneah the ulcer at the eighth right costo-chondral junction a large amount of caseous pus is present. The musculature is bright red but small in amount. The great omentum hangs down over the front of the bowel and contains a small amount of yellowish brown fat. The small intestine is collapsed, the large intestine is distended with gas. The appendix is large, red, swollen with engorged blood vessels and is twisted on itself, being curved under and through the meso-appendix over the brim of the pelvis. Multiple retrocaecal fossae are present and there are many small pit-like depressions leading away from these fossae. The right inguinal canal is patent to the extent of two fingers breadth. The spleen is slightly enlarged. There are no adhesions about the gall-bladder, which is empty and extends to the liver margin. The meso-colon, peritoneum, and mesentery are adherent to the under lobe of the liver to the right of the gall bladder. The vessels are engorged and purplish. The lower edge of the liver falls 4 cm. short of the costal margin and is white, thin and fibrous.

The peritoneum is smooth, moist and glistening, and the cavity contains no excess of fluid. Anterior to the abdominal aorta and between it and the inferior vena cava are numerous lymph glands varying from 0.2 cm. to 3.5 cm. in their greatest dimensions. These become larger and more numerous towards the left renal vein, around which they form a cluster of adherent but distinct glands, which are grayish red and mottled with hemorrhages.

The lungs do not collapse but are hugely emphysematous, filling the chest cavity. They are grayish white and uniformly distended. The pleura are moist, smooth and glistening, and there is no increased amount of fluid here. The heart is free and the pericardium is smooth, moist, and glistening, and contains a small amount of blood-stained fluid. In the region of the thymus there is a small amount of thymic tissue, and a few scattered lymph glands, black with coal dust.

The mucous lining of the esophagus is unchanged. The entire intima of the aorta is smooth and glistening except in the isthmus, where there is a yellowish white indefinite scar 1 cm. in diameter. At the bifurcation of the trachea are small lymph glands, slightly hyperemic and containing coal dust but showing no foci of tuberculosis. There is frothy mucus in the trachea, the walls of which are red and the blood vessels engorged and show slight infection.

In the pulmonary artery there is free blood and a little clot. The left auricle is filled with a dark black clot. The mitral valve admits two fingers. In the right ventricle there is free and clotted blood—all clots being post mortem. The pulmonary leaflets are unchanged and there are no changes in the left auricle or mitral valve. The foramen ovale is closed and there is a narrow membraneous Eustachian valve present.

In the apex of the upper lobe of the right lung there are scattered patches of conglomerate tubercles occupying a region 5 cm. in diameter. Lying along the common bile duct close to the cystic duct are three lymph glands which are soft and white and streaked with red. These are surrounded by scar tissue.

Addendum: In the globus major of the right testicle there is a discrete caseating tuberculous focus and more healed foci about it. In the prostate there are three or four tuberculous foci which are iregular in outline and definitely encapsulated but still caseating. Streaming up from the back of the prostate and growing progressively larger as the right kidney and renal veins are approached, is a chain of lymph glands alluded to elsewhere in this record; they seem to lead directly to a large fibrous mass covering the upper anterior two-thirds of the right kidney. This mass caps the kidney and includes the suprarenal gland. Upon incising this a cold abscess is found and the suprarenal gland is greatly enlarged and involved in a fibro-caseous tuberculous process which completely obliterates its normal markings and modifies its outline. From here glands similarly involved course across to the other suprarenal gland which is enlarged and occupied by a similar diseased process as that on the right side, thus the route of progression seems outlined by the anatomic changes.

The spleen is small and shrunken, the liver pale and atrophied. No generalized miliary tuberculosis can be found.

THE LITERATURE ON THE INTERNAL SECRETIONS

GENERAL SUBJECTS

A New Ductless Gland (Glandula insularis cervicalis). Pende (N.) Mikroskop. Anatom. Arch. (Bonn) 1914, lxxxvii,193.

This gland is close to the thyro-parathyro-thymic system; is made of small epithelial islands (15-20), which surround the thymus and the thyroid lobes. Most of them are in the connective tissue of the superior lobes of the thymus, outside of the capsule.

In the newborn the glandular nodes are bigger and can be seen as many little clusters scattered around the perithymic and the peri-para-thyroid tissue. They have no capsule, but can be easily distinguished from the surrounding tissue; so that under the microscope they look like cellular clusters neatly isolated. Inside there is no real connective stroma. The epithelial-like cells are rather large, with a well delimited protoplasm and a central vesicular nucleus. In some cells there are vacuoles, which increase with the age. The metaplastic granules of these cells are made up of lipoids (Ciaccio system) and according to the author they constitute the essential secretion of the gland. There are neither excretory ducts, nor follicles, nor colloidal spaces. The author calls this fourth gland Glandula Insularis Cervicalis.—G. V.

ENDOCRINE GLANDS, Effect of the Chloroform Narcosis on the. Scaglione (S.) Virch. Arch. 1915, ccxix.

Starting from the observations of Delbert, who believes the chloroform to act on the adrenals, the author, basing his opinion on a series of experiments, states that in case of death through chloroform narcosis there must be either lesion or insufficiency in the endocrine function.

During the first hours of narcosis he found the chromaffin reaction greatly reduced and no reaction at all under protracted narcosis.

In the other glands more lipoids and secretory granules were found in the beginning and a marked decrease under protracted narcosis. According to the author, these findings show that the endocrine glands rapidly secrete antitoxic substances.—G. V.

(THYROID) Etiology of Endemic Goiter. Stiles (C. H.) Detroit Med. Jour. 1916, xvi, 93.

A brief summary is given of the history of endemic goiter, also an account of goiter districts throughout the world. The article is of interest, chiefly, for the summary of the work of Marine and Lenhardt on thyroid carcinoma in trout. It was found by these authors that the degree, frequency and rapidity of development of thyroid hyperplasia in trout was in direct proportion to the degree of contamination of the water and that spontaneous recovery almost invariably occurred when the trout were removed from infected tanks. Mention is made, also, of the work of McCarrison, who produced goiter in himself and others by the administration of suspended matter gathered from the sides of tanks and wells containing goiter producing water.

Stiles speaks of the remarkable results following the administration of a vaccine made from an ameba obtained from the excreta of goiter patients.—F. B. L.

(THYROID) Over het voorkomen van struma (The occurrence of goiter). Kappenburg (B. D. G.) Nederlandsch Tijdschrift voor Geneeskunde, 1916, ii, 2079.

Kappenburg has found that of the 493 nurses in Utrecht, 56 (11 per cent.) had a struma. In other Dutch towns the number of struma patients is much less. He found also that though struma is very rare in children of six years and younger, in Utrecht many children under six years suffer from it. He found an enormous number in the little village Vreeswyk, where the people use the water of the river (the Lek). He also discovered a great number in places situated on another little river (the Linge) which gets its water from the Lek. He is quite aware that, though the theory of the water sounds very simple, it has never been proved. The author found also that nurses in lunatic asylums suffered much more from struma than other nurses.—J. K.

PARATHYROID Glands. Vermeulen. Nederlandsch Tijdschrift voor Geneeskunde, 1916, ii, 2520.

Vermeulen has examined the situation and the histological structure of the parathyroids in different domestic animals microscopically. He finds (according to Kohn) three types: 1. Glands composed of epithelium only, with very little blood and connective tissue (sheep, goat, and one of the glands of the horse). 2. Glands with much blood, much connective tissue and fat (cow, pig, the lateral gland of the

horse). 3. Glands composed of trabeculae of cells placed round a lumen (man, dog).

For practical purposes we can but utilize the glands of sheep and goat; horses may be used, too; however, it is difficult to find the glands in some cases. The ordinary source of parathyroid material is the pig, but this is, according to the author, not desirable as the situation of the glands is very inconstant.—J. K.

(ENDOCRINE ORGANS) Internal Secretory System in Ophthalmology with Special Reference to Goiter. Lamb (R. S.) Ann. of Ophth. (St. Louis) 1917, xxv, 244.

The author endeavors to state concisely the results of a vast amount of observation. He takes note first of the difficulty in attempting to identify most of the symptoms regarded as being due to the secretion, or lack of it, in connection with any one gland; though he emphasizes the necessity for making the attempt so to do. He calls attention to the very close association between the sympathetic proper and vagus or autonomic system and then endeavors to show the effect of stimulating the sympathetic in both mild and marked intensity—considering the probable etiology of Graves' disease—and then the effect of the stimulation on the vagatonic or autonomic system is considered and its possible effect as a causative factor in acute inflammatory glaucoma; the effect of internal secretory imbalance upon esophoria and exophoria; ciliary congestion and chorioretinitis; disturbance of visual acuity, ocular fixation and hemianopsia are also considered. The hope is that many reading the article may correlate their own observations and at as early a date as possible make contributions to the literature on this subject.—R. S. L.

(SEX, GONADS) The Theory of Sex as Stated in Terms of Results of Studies on Pigeons. Riddle (O.) Science (Lancaster, Pa.) 1917, N. S. xlvi, 19.

In the concluding paragraphs of an article on the essential nature of sex differences the author states that: "Studies on the effects of castration, gonad-transplantation, and gonad-extract injection, constitute a large body of observations which deal with sexual phenomena associated with the internal secretions of the sex-glands. These internal secretions, let it be remembered, are themselves metabolites, which have the capacity to influence the metabolism of some, many, or of all the tissues with which they come in contact, or which they may reach indirectly.

"The results, as a whole, demonstrate that the extent of sexual modification in the experimental animal is, in general, in proportion to the immaturity of the treated animal. That is to say, the earlier the internal secretion of the gonad is supplied or withdrawn, the more profound is the sexual modification of the individual. The stag is a form that has long been known to show thus a considerable and beautiful series. The free-martin is now known (Lillie, 1916) to exemplify a much earlier point at which the foreign internal secretion begins to act; and here, true to the rule that has been established elsewhere in all this general line of work, the resulting modification is correspondingly strong and striking. When, by whatever means, we effect a change in the metabolism (which is the essential thing) at a still earlier stage—in the egg-stage, in our own and in some other experimental reversals of sex—then we obtain individuals whose sexual nature is quite thoroughly reversed; in many cases completely so, and in still other cases with varying degrees of completeness.

"Professor Whitman's main decisions concerning the nature of sex may here be briefly stated. These decisions were that the male proceeds from a 'stronger' germ, has greater 'developmental energy' and 'carries the processes of development farther' than does the female. I am confident that his results fully justify his conclusions; and that these are in the completest harmony with the later and fuller development of the sex-studies in the pigeons, and thus with the theory of sex which has been outlined in these pages.

"In conclusion, our present definite knowledge of the metabolic basis of sexual difference, and the methods of attack which this new knowledge brings with it, offer the surest guarantees that the problem of sex can now be studied—and, indeed, the basal facts of the problem must be studied—in the field of the elemental protoplasmic functions."—(Quoted.)

"INTERNAL SECRETION" The Nomenclature of. Bell (W. B.) Lancet (London) 1917, cxcii, 4871.

In a communication to the editor of the Lancet, the suggestion is made that the word "Hormone" be used indiscriminately for every internal secretion and that the hormone manufacturing organs, or the endocrine organs, be spoken of as the "Hormopoietic" organs and that the process be designated "Hormopoiesis."

The reasons for the use of these terms is that they are derived directly from the term "Hormone" and that their meaning is quite clear.—W. B. T.

A Contribution to Vegetative Neurology: Touching upon Heart Action, Status-Lymphaticus, and So-Called Vagotonia and Sympathicotonia. Tracy (E. A.) Boston M. & S. Jour., 1917, clxxvi, 538.

The skin of a normal individual, when stroked, gives the reaction of vaso-constriction, this appearing as a whitish streak (in Caucasians). The writer found some patients in which no reflex vaso-constriction appeared after stroking. These patients a few minutes after having had injected into them, therapeutically, a dose of adrenin, gave the reaction of vaso-constriction when again stroked. Stroking causes more stimuli to flow over the nerves concerned in the phenomenon, that is, it increases the tonus of the sympathetic fibres—if we regard the tonus of a nerve to be measured by the number of stimuli going over it. In the cases mentioned —those of patients without the reflex of vaso-constriction to stroking—we could increase the tonus of the nerves, that is, increase the stimuli flowing over them, as much as is possible by stroking, and yet no vaso-constriction resulted. In other words, increasing the tonus of the sympathetic nerve fibres—the nerves concerned in vaso-constriction—does not cause vaso-constriction. The same patients, shortly after having had an injection of adrenin, gave the reflex vaso-constriction on stroking. The only change in the conditions was the addition of adrenin to the blood stream. It must be granted, therefore, that reflex vaso-constriction is caused by an increase of the nerve stimuli plus adrenin in the blood stream. Heart action is brought into relation with the hormones in the blood stream—which are known to cause dilation and contraction of the peripheral blood vessels together with stimuli coming over the autonomic and sympathetic fibres. The heart, of similar musculature and with similar innervation, probably reacts to blood hormones in a similar manner as do the peripheral blood vessels. Stimuli coming over the autonomic (vagus) fibres together with hormone X in the blood stream cause diastole of the heart, and stimuli coming over the sympathetic fibres together with adrenin in blood stream cause systole. This view of heart action explains the occurrence of death in status thymo-lymphaticus, the cause being superabundance of hormone X in the blood stream and insufficiency of adrenin. The dilatation of the heart is provided for, but the insufficiency of chromaffin tissue causes lack of adrenin, without the stimulus of which the heart cannot contract, no more than, as we have seen, the blood vessels can.

Status-lymphaticus may be diagnosed by the absence of anemic dermography, showing lack of adrenin in the blood stream.

Observation and experiment show that so-called vagotonia and sympathicotonia are due to a hypercontent in the blood stream of the respective hormones, and not to a true hypertonus of the nerves involved.—E. A. T.

(The sum total of the available evidence makes the existence of "hormone X" extremely improbable. That adrenin in significant amounts occurs in the normal blood stream is also open to doubt. It is probable, therefore, that other explanations will be found for the phenomena discussed. The fact that artificially administered adrenin plus reflex vasomotor stimulation give greater effects than either alone is what would be expected as an example of "summation of stimuli."—Editor.)

(PARATHYROID) Physiology of the Parathyroid Gland. Koch (W. B.) J. Lab. & Clin. Med. (St. Louis) 1916, i, 299.

The author in an excellent study of the subject shows that the behavior of a parathyroidectomized dog may coincide with either of two distinct groups of symptoms, or with a mixture of these two types, in which one may predominate.

(a) In one type, the dominant feature is over-excitability of the nervous system.

(b) In another, the dominant feature seems to be under-excitability.

In the former, tonic convulsions are characteristic and in the latter we observe a peculiar muscular flaccidity and a general depression of the nervous system. In either case, death occurs in from two to ten days.

The writer has varied from the usual studies in that he performs careful post-mortems on his subjects. In the dogs dying with typical tetany, the most striking changes were found in the blood, liver, kidney and brain. The ordinarily invisible intestinal vessels were so dilated as to be easily traced. The liver and spleen were markedly congested; the intestinal tract edematous and the bladder full of urine. The blood showed extensive ante-mortem clots. Section of the liver showed fragmented erythrocytes, normoblasts, erythroblasts and cell shadows. There were also many mononuclear cells with eosinophil granules. The kidney showed congestion and hemorrhagic areas in the cortex. Spleen contained much pigment. The brain showed the cells in the motor area with partial loss of Nissl substance and typical tetany nuclei.

The totality of all of these symptoms points to a hyperexcitability of the whole nervous system, including those neurons continued to the cord via the sympathetic.

Two of the 47 dogs exhibited what the writer calls a negative phase. They slept in a peculiar state of flaccidity with the limbs somewhat flexed. They moved very little and died in four days with no other symptoms. The writer thinks that these cases correspond to over-stimulation of the central nervous system comparable to shock.

As regards the relation of the parathyroids to tetany very few details are known. The one definite piece of work seems to be that of MacCallum who showed that the urine of these animals contained excessive calcium and that injection of calcium controlled the convulsions. Others have shown, however, that similar salts have an identical but not so marked an effect and that even the calcium action wears off in a few days. The writer observed that tetany could be controlled by aqueous salts and when this was no longer efficient the kidneys were no longer functioning. So he believes that all salts act as diuretics aiding in the excretion of a hypothetical toxin and that calcium is simply more efficient due to its depressing qualities. Accordingly, Koch advances the theory that tetany is simply an intoxication; that the toxin is subdued by diuresis, by neutralization and is not toxic in the presence of the parathyroid gland.

To confirm this supposition, he has attempted to isolate this body from the urine and has found two substances. One is methylcyanamide and the second trimethylmelanine. The injection of 27 milligrams produces tetany in rabbits.

Koch concludes: (1) somewhere in the body methylcyanamide is generated; (2) this substance has a physiologic effect in normal animals; (3) after parathyroid extirpation this substance accumulates to toxic quantities, and is responsible for the death of these animals.—J. R. G.

(ENDOCRINE GLANDS) A Review of the Advances in Our Knowledge of Internal Secretions During the Last Two Years. Park (E. A.) Am. Jour. Dis. Child. (Chgo.) 1916, xii, 477.

A very excellent review of the general subject of endocrinology and worth reading in detail.—J. R. G.

(ADRENALS) The Present Status of the Adrenal Problem. Hoskins (R. G.) J. Lab. & Clin. Med. (St. Louis) 1916, i, 512.

See Endocrin., 1917, i, 292.

ADRENIN and Other Vasoconstrictory Substances in the Animal Organism. Baraden (D. W.) (Dissertation, Petrograd, 1916, 94 pp.)

The author shows that the serum and extracts of different organs, if perfused through the isolated ear of a rabbit, constrict the peripheral vessels, and this capacity, with the exception of the adrenal extract, is augmented by letting them stand, and especially by heating them; but this rise of the vasoconstrictor power by heating only occurs up to a certain temperature, after which there is a fall. Embden and v. Fürth showed that a mixture of serum and adrenalin gives a stronger effect than either does separately. Following this up, the author shows that the same result is obtained by a mixture of adrenalin and different organ-extracts. If the mixture of different extracts is used, only a slight vasoconstricting effect is produced, with the exception of the adrenals and liver, which are similar in their action. The same extracts and serum with isolated gills give a very strong constriction, whereas adrenalin by itself dilates their vessels. The action of the adrenal extract on them is very inconstant. It causes sometimes dilatation, sometimes constriction. Heating the extract diminishes its constricting power on the vessels of the ear, but apparently augments it with regard to the vessels of the gills. These properties of the adrenal extract show, according to the author, that in the blood and in the organs there are other vasoconstricting substances besides adrenin. In the adrenal extract the action of the adrenin and of these other substances is combined, and to that the variety of the action of this extract is due. The constricting action of the adrenal extract is diminished in phosphorus-poisoning. The action of serum and of the extract of other organs is, under these conditions, changed in a less degree.—(Physiol. Abstr.)

(ADRENALIN) Der Suprareningehalt handelsüblicher Suprareninpräparate und die Art seiner Festellung. Johannessohn (F.) Biochem. Zeitsch. (Berlin) 1916, lxxvi, 377.

Folin's colorimetric method of estimating adrenalin proved very accurate when tested by the Läwen-Trendelenburg transfusion method, but it was vitiated by the presence of alypin and novocaine. For the determination of the adrenalin content of commercial preparations a satisfactory colorimetric method was devised which was based on the Fränkel-Allers-Bayer reaction with iodic acid in presence of sulphanilic acid. Many fresh preparations yielded 70 to 80 per cent. of the stated content. The drug deteriorates less in

ampullae than in tabloid form, particularly if hydrochloric acid is present in the former.—(Physiol. Abstr.)

(THYROID) Relations between the Histological Structure of the Thyroid Gland and its Content in Iodine. Pellegrini (R.) Arch. sci. med. (Torino) 1916, xl, 92.

There is no definite relation between the amount of colloid and the amountof iodine per gr. dry substance in the human thyroid, the one often being high while the other is low. Six types of thyroid were recognized, a definite (within certain limits) content of iodine corresponding to each; many intermediate types also exist. The variations in the density of the colloid correspond to different degrees of functional activity, the more dense and recently secretd colloid being richer in iodine.—(Physiol. Abstr.)

(THYROID) Blood-Sugar Estimation in a Case of Infantile Myxedema. Nilsson (N. O.) Upsala Läk. Förhandlingar (Upsala) 1916, xii, 106.

A rise in the blood-sugar after the administration of sugar persisted for a long time, as it does in diabetes mellitus. The thyroid is believed to stimulate the chromaffine system. The reaction to adrenalin injection was therefore tested before and during thyroid treatment in this case. A dose of half a milligram of adrenalin before thyroid treatment raised the blood-sugar percentage from 0.09 to 0.17; the mononuclear leucocytes increased from 2210 to 7400. During thyroid treatment the response was in the same direction, but not so marked.—(Physiol. Abstr.)

EXPERIMENTAL INVESTIGATION

ADRENIN, Quantitative Studies on the Liberation of, from the Adrenals after Section of their Nerves, with Special Reference to the Question Whether Adrenin Is Indispensable to the Organism. Stewart (G. N.) and Rogoff (J. M.) Proc. Soc. Exp. Biol. and Med. (N. Y.) 1917, xiv, 145.

"1. We showed in a previous paper by the blood pressure and eye reactions that after section of the nerve supply of the adrenal no demonstrable liberation of epinephrin was present in cats as long as five weeks after nerve section.

"2. As it is easier to detect very small concentrations of epinephrin by the rabbit intestine and uterus segments, we have made a series of experiments (on 7 cats) in which these tests were used to supplement the eye reactions. In all the animals one adrenal was excised and the nerves of the other cut.

"In a cat tested two weeks after the operation, it was shown that the adrenal blood serum could not have contained 1:300,000,000, or the blood 1:400,000,000, of epinephrin; and that the rate of liberation of epinephrin could not have been at most 0.000001 mgm, per minute for one adrenal. In another cat three weeks after the operation the serum of the adrenal blood was proved to contain less than 1:400,000,000, and the blood less than 1:700,000,000 epinephrin. The output of epinephrin per minute could not have been as much as 0.0000009 mgm. per minute, for one adrenal. The segments used for the tests in these experiments were extremely sensitive, and the limits of adrenalin concentrations that could be detected with certainty were carefully determined. The eye reactions were negative. In these two cats the rate of liberation of epinephrin, if any liberation whatever was going on, must have been several hundred times less than the rate in normal animals under the same experimental conditions.

"It is scarcely necessary to point out that experiments yielding completely negative results indicating the absence of epinephrin with very sensitive test objects are much more important for the questions studied than experiments in which small amounts of epinephrin can still be detected. For it is impossible to be certain that when a little epinephrin is found some of the fibres concerned in the liberation may not have escaped section.

"3. Since these animals had completely recovered from the operation and behaved in every way like normal animals, it must be concluded that the liberation of epinephrin from

the adrenals is not indispensable for life or health, unless indeed the necessary quantity is, even in the adrenal vein blood, below the limits of detection by the methods used. It must be remembered that the epinephrin in the adrenal blood is diluted enormously (probably at least 100 times) in the right heart; so that in these cats the concentration in the arterial blood could not at most have reached 1:40 billions and 1:70 billions, respectively.

"If the liberation of epinephrin is abolished by division in the dorsal cord of the path concerned in it, as our experiments on 'Relation of the Spinal Cord to the Spontaneous Liberation of Epinephrin' indicate, this corroborates the conclusion that epinephrin is not indispensable. Numerous animals and men have long survived such lesions.

"4. These experiments indicate that the entire liberation of epinephrin from the adrenals is controlled by nerves.

"5. In a third cat (8 days after operation) the adrenal vein blood contained epinephrin but in concentration not exceeding 1:125,000,000. The output of epinephrin per minute was probably at most not more than one-hundredth of what might be expected in a normal animal.

"6. In a cat 15 weeks after the operation it was doubtful if any epinephrin was present in the adrenal vein blood. In two others 15 weeks after operation eye reactions and segment tests showed the presence of a small amount of epinephrin, the rate of liberation being a mere fraction of the normal. The possibility of regeneration of fibres after this interval must be considered. In the seventh cat (tested two weeks after the operation) the eye reactions were negative. The segment tests revealed a small concentration of epinephrin in the adrenal blood (less than 1:30,000,000) corresponding to a rate of liberation of epinephrin per minute of at most one tenth of the normal." (Original article quoted in full.)

(ADRENIN) Epinephrin and Ergotoxin, Action of, upon Single, Physiologically Isolated Cells. Spaeth (R. A.) and Barbour (H. G.) Jour. Pharm. and Exp. Therap. (Balt.) 1917, ix, 431.

This research was done upon the melanophores (pigment cells) of the common "killi fish," Fundulus heteroclitus. The melanophores of this fish as of all other vertebrates are controlled by the thoracico-lumbar autonomic (sympathetic) system. The melanophores are apparently modified smooth muscle cells. It was found that adrenin in all dilutions up to 1:50,000,000 caused complete contraction of the pigment cells. Ergotoxin has relatively slight effect upon the cells but causes a slight expansion. Melanophores exposed to the action of

ergotoxin, however, subsequently react to adrenin by expanding. This effect of ergotoxin is comparable to its influence upon the vascular smooth muscle; after a dose of the drug adrenin in quantities that previously had a pressor effect will cause a fall of pressure. The reactions to ergotoxin and adrenin confirm the belief that the melanophores are in reality modified smooth muscle cells.—R. G. H.

(ADRENIN) The Vascular Reactions in Experimental Acute Tartrate Nephritis. Karsner (H. T.) Jour. Pharm. and Exper. Therap. (Balt.) 1917, ix, 483.

In dogs subjected to experimental tartrate nephritis adrenin was observed to produce its ordinary effect, viz., renocontraction and depression of urine formation.—R. G. H.

ADRENIN, Relation of Spinal Cord to Spontaneous Liberation of. Stewart (G. N.) and Rogoff (J. M.) Proc. Soc. Exper. Biol. and Med. (N. Y.) 1917, xiv, 143.

In the experiments the pupil reaction was used as an index of the presence of adrenin, it having been sensitized by the previous removal of the superior cervical ganglion. The blood from the adrenal vein was collected in a pocket fashioned from the vena cava and liberated en masse in order to get the maximum adrenin reaction. The pupil test was supplemented in some instances by the rabbit intestine and uterus tests.

It was found that section of the spinal cord in the cervical region had no detectable influence on the adrenin output. (Several cases.) In one experiment section of the cervical cord had not checked adrenin discharge but cutting it between the fourth and fifth dorsal vertebrae checked the discharge. Stimulation of the cut cord caused a renewed discharge. In a similar experiment quantitative determinations were made. After section of the dorsal cord no discharge of adrenin could be detected; it was proven that if any discharge was occurring it was less than enough to give a concentration of 1:100,000,000 in the adrenal vein or at most not one one-hundredth the amount to be expected in a normal cat under the existing experimental conditions.

Cutting the nerves supplying the adrenal glands was shown to lessen greatly or completely to abolish adrenin discharge .

These observations would seem to establish the fact that adrenin discharge is under reflex control, the control being mediated by the spinal cord at a level below the cervical region.—R. G. H.

PINEAL GLAND, Function of, in Relation to Pigmentation. McCord (C. P.) and Allen (F. P.) Jour. Exp. Zool. (Phila.) 1917, xxiii, 207

This paper records some very striking results obtained by feeding pineal substance or pineal extracts to tadpoles. The color of the animals depends largely upon a layer of subepidermal pigment cells (melanophores). When the melanophores are expanded the tadpoles are dark in color. When contraction of the melanophores occurs the color becomes much lighter and the organisms translucent. When fresh pineal gland substance was fed to ten-day tadpoles a marked retraction of the pigment cells took place so that at the end of thirty minutes the fed animals were noticeably lighter than the controls. Maximum translucency was attained in forty-five minutes and restoration to the original color occurred in three to six hours. Alcoholic and acetone extracts of pineal substance were also investigated. But little of the active substance was removed by alcohol while it was removed completely by acetone. Tadpoles placed in a 1:500 pineal emulsion (from acetone extract) were noticeably lighter in five minutes and the maximum effect was obtained in a half hour. In higher dilutions the effect was slower in developing and less complete in degree.

In commenting upon their results McCord and Allen mention the fact that the pineal gland has been evolved from a parietal eye which reached its highest form of development in certain of the lizards. In various animals the changes of color are regulated by the eyes. It is interesting to note that although the pineal has completely lost its ocular function it still retains an ability to produce a substance capable of controlling pigment cell changes. The technical methods of the investigators are worthy of high commendation. A large number of animals (12,000) was employed and the control animals were fed with indifferent tissues—brain or muscle. The research is valuable in affording a clean-cut proof of the presence of an active substance in pineal tissue—a fact which some investigators would not hitherto have been willing to concede.—R. G. H.

(DUCTLESS GLANDS) Changes in the Relative Weights of the Various Parts, Systems and Organs of Very Young Albino Rats Underfed for Various Periods. Stewart (C. A.) Anat. Rec. (Phila.) 1917, xi, 410.

Results: Increase in the weight of the adrenal glands, testes, ovaries, hypophysis, a decrease in the thymus and no change in the thyroid and pineal body.—E. R. H.

(GONADS) Early Castration of the Vertebrate Embryo. Reagan (F. P.) Anat. Rec. (Phila.) 1917, xi, 251.

An extirpation was made in young chick embryos of the small crescentic area of entoderm anterior to the body axis where the early germ-cells are found, and from which they were supposed by Swift to migrate via the blood vessels to the gonads. After the operation the embryos were allowed to develop but no germ-cells were developed in the gonads and hence Swift's view is upheld.—E. R. H.

(OVARY) The Ovarian Cycle in Mice. Smith (H. P.) Anat. Rec. (Phila.) 1917, xi, 407.

Ovulation in mice occurs spontaneously at intervals of 17.5 days. It occurs 18 days after parturition. The ovum of mice requires two days to traverse the greater part of the oviduct, and remains in the last loop one day.—E. R. H.

(THYROID) On Thyroidectomy in Amphibia. Hoskins (E. R.) and Morris (M.) Anat. Rec. (Phila.) 1917, xi, 363.

The thyroid anlage was successfully removed from young embryos of the frog and amblystoma before the functional stage. The operation seemed to delay growth and metamorphosis in the frogs, but there were no changes in the hypophysis. No change was seen during the three months of the observations in the amblystoma larvae except perhaps a slightly delayed growth. The experiment is to be repeated on a larger scale.—E. R. H.

(THYROID AND THYMUS) Studies on Internal Secretion IV. Treatment of Tadpoles with Thyroid and Thymus Extracts. Gudernatsch (J. F.) Anat. Rec. (Phila.) 1917, xi, 357.

Thyroid and thymus were each split chemically into seven products and tadpoles were treated with the substances obtained. The thyroid nucleo-proteins caused most rapid differentiation, and the precipitate from an alcohlic extract produced the greatest growth with the least differentiation. The other substances ranged between these two extremes in their action. Two of the seven thymus products delayed differentiation but the other five did not do so.—E. R. H.

THYROID, The Early Morphogenesis of, in Squalus Acanthias. Norris (E. H.) Anat. Rec. (Phila.) 1917, xi, 396.

The gland appears as a solid bud in the floor of the pharynx of embryos of 4 mm.. It becomes severed at 19 mm. and appears as a column, ovoid in section, and then forms into a diamond-shaped plate that is smooth at first, but is later

traversed by many ridges. Cavities that develop transform the plate into irregular smaller plates.—E. R. H.

(HYPOPHYSIS) The Development of, in Reptiles (Turtles, Lizards, Snakes and Alligators). Baumgartner (E. A.) Jour. Morph. (Phila.) xxviii, 209.

The epithelial anlage forms three parts of the hypophysis, namely, pars intermedia, pars tubularis and the anterior lobe. The first two are composed in the adult of columns of clear staining chromophilic cells, and the anterior lobe of columns or acini of clear staining chromophilic cells which may be either acidophilic or basophilic.—E. R. H.

HYPOPHYSIS, Effects of Inanition and Refeeding upon the Growth and Structure of, in the Albino Rat. Jackson (C. M.) Anat. Rec. (Phila.) 1917, xi, 368.

After birth the anterior lobe normally becomes relatively larger, the posterior lobe smaller and the intermediate part remains the same. In young rats held at maintenance, the anterior lobe loses relative volume. In an adult with chronic inanition, the anterior lobe was decreased, and in two adults with acute inanition, the anterior lobe appeared to be increased. After refeeding, the gland usually returns to normal. The loss in inanition and maintenance in the anterior lobe is confined to the parenchyma, and in this both the cytoplasm and nuclei suffer. Inanition decreases greatly the number of mitoses seen in the hypophysis, but they become more plentiful on refeeding. The nuclei in inanition become hyperchromatic and the cytoplasm may stain poorly. About four weeks' time is required for the hypophysis to return to normal on refeeding after inanition.—E. R. H.

GONADS. Further Data on the Relation between the Gonads and the Soma of Some Domestic Birds. Goodale (H. D.) Anat. Rec. (Phila.) 1917, xi, 512.

Data on ablation of testes and ovaries and on the transplantation of the ovary into castrated males has made it clear that different parts of the soma (body) react in different ways to the secretion of the gonads. The characters fall into 3 groups: 1. Those independent of either ovary or testes; size in females, voice, some phases of behavior, and mandible color in ducks. 2. Characters affected by the testes: comb and wattles, fat deposition, size in the male, some instincts and summer pluamge in ducks. 3. Characters affected by the ovary: plumage, form and color and some phases of behavior. Castrated females are sexually neutral, but emascu-

lated (feminized) males (transplanted ovary) exhibit masculine sexual behavior. The entire series of gonadectomized individuals may be looked upon as a series of sex intergrades in which characters that are normally found in one sex may be experimentally transferred to the opposite sex while individuals composed of mixtures of such characters may be obtained.—E. R. H.

(HYPOPHYSIS, THYROID, GONADS, THYMUS) Extirpation of the Hypophysis and Thyroid Glands in Rana Pipiens. Allen (B. M.) Anat. Rec. (Phila.) 1917, xi, 486.

Hypophysectomy caused failure in proper development of the dermal pigment, hind legs and amount of colloid in the thyroid, but no changes in the gonads and thymus. Thyroidectomy caused failure in metamorphosis although the tadpoles became very large. Feeding thyroid hastened metamorphosis in thyroid free larvae.—E. R. H.

(HYPOPHYSIS) The Effect of Hypophysectomy upon the Subsequent Growth and Development of the Frog. (Rana Boylei.) Smith (P. E.) Anat. Rec. (Phila.) 1917, xi, 57.

After hypophysectomy in young stages the thyroid, dermal pigment and hind legs failed to develop properly.
E. R. H.

HYPOPHYSIS of the Guinea Pig. Vanderburgh (C. M.) Anat. Rec. (Phila.) 1917, xii, 95.

A description of the gross and microscopic features of the hypophysis. In most respects it resembles that of other mammals. Cysts, some of which were lined with ciliated epithelium, were found in the pars intermedia and pars glandularis. These were interpreted as cut off portions of the cleft. The colloid in the cleft and cysts was granular and resembled mucus. Colloid was found in the pars nervosa and tuber cinereum, but it probably was secreted by the pars intermedia.—E. R. H.

(ADRENIN, PITUITRIN) Pharmacology of the Vagina. Waddell (J. A.) Jour. Pharm. and Exp. Therap. (Balt.) 1917, ix, 411.

Excised strips of vagina suspended in warm oxygenated Tyrode's solution were found to undergo spontaneous rhythmic contractions. The addition of adrenin stimulated the strips in case of rabbits, dogs, hogs and sheep while in case of rats, cats, guinea-pigs and cows depression occurred. In the former group, therefore, the sympathetic innervation is predominantly motor and in the latter group, predominantly

inhibitory. In case of the rabbit ergotoxin served to convert the stimulating effect of adrenin to inhibition. This animal, therefore, possesses both inhibitory and excitatory sympathetic fibres. (Probably true also of other animals.) In the various species studied the reactions to adrenin in the uterus and the vagina were similar.

Pituitary extract, as would be expected, stimulated the vaginal musculature.—R. G. H.

ADRENIN; Distribution between Corpuscles and Plasma. Stewart (G. N.) and Rogoff (J. M.) Jour. Pharm. and Exp. Therap. (Balt.) 1917, ix, 393.

As nearly as could be determined by blood pressure, colorimetric or intestine and uterus methods of assaying, adrenin in blood occurs only in the plasma.—R. G. H.

HYPOPHYSIS, On the Relations between Neural and Intermediate Portions of. Atwell (W. J.) Anat. Rec. (Phila.) 1917, xi, 322.

Development of hypophysis in the rabbit. In early stages the neural and intermediate parts become fused in four regions where the basement membranes are lacking. Apparently this connection is lost later.—E. R. H.

HYPOPHYSIS, The Golgi Apparatus in the Cells of the Distal Glandular Portion of. Addison (W. H. F.) Anat. Rec. (Phila.) 1917, xi, 317.

The apparatus is found in both acidophilic and basophilic cells and persists throughout the changes in the hypophysis produced by castration, apparently functioning as a definite cell organ. In the large basophilic cells it appears near the nucleus as a round or oval condensed spot surrounded by a lighter ring.—E. R. H.

(THYROID) Influence of Thyroidectomy on Blood Sugar. Janney (N. W.) and Isaacson (V. I.) Proc. Soc. Exp. Biol. and Med. 1917, xiv, 99.

Previous work in some cases has shown a decrease in blood sugar and in some an increase when the thyroids are removed. Injury to the parathyroids is probably one factor in the disparity. In Janney and Isaacson's dogs at least two parathyroids were left intact and the freedom of the animals from tetany showed that functional integrity had been maintained. After the thyroidectomy the blood sugar averaged about 25 per cent. lower than normal. Glucose feeding resulted in less elevation of the blood sugar level after than

before thyroidectomy. On the grounds that cretinism, myxedema, Addison's disease and experimental adrenal deficiency are all marked by hypoglycemia the authors offer this as a general sign of endocrine deficiency. They suggest that diabetes mellitus might possibly be benefited by removal of thyroid tissue—R. G. H.

(ADRENIN) Henle's Reaction of the Chromaffin Cells in the Adrenals, and the Microscopic Test for Adrenalin. Ogata (T.) and Ogata (A.) Jour. Exp. Med. (Balt.) 1917, xxv, 807.

The authors review at some length the literature on the so-called chromaffin reaction of adrenin producing cells. Whether the characteristic brown color which results from the application of chromium salts to the adrenin producing tissues is to due to a specific reaction has been an open question. The problem was investigated using the fresh adrenals of various animals. Human adrenals were also used but were found not very suitable since the reaction was weaker than in the case of the adrenals of healthy animals. It was found that the chrome reaction as well as the silver and osmium reactions are merely reductions by adrenin. In their opinion the naming of the cells giving a positive reaction should not be based upon the reaction (i. e., chromaffin cells), but on the presence of adrenin itself. Biedl's terms, adrenal cell, adrenal organ, adrenal body, adrenal system, and also Bonnamour's term, adrenalin-producing cells, are appropriate in this respect. They propose the names adrenalin cell, adrenalin tissue, adrenalin system, thereby indicating the presence of adrenalin.

The authors might well have gone one step further and eliminated the useless syllable in "adrenalin." One of the unfortunate features in the endocrine literature is its cumbersome terminology.—R. G. H.

THYROID, Effects of, upon Paramaecium. Shumway (W.) Jour. Exp. Zool. (Phila.) 1917, xxii, 529.

Earlier researches have established the fact that the division rate of pedigreed races of Paramaecium affords an index to their vitality. Determinations of the division rate can be utilized, therefore, in the investigation of various factors affecting metabolism. Shumway in the present paper reports an extension of earlier investigations of the effects of thyroid (and other endocrine gland substances) on these unicellular animals. Each experiment was carried out on a group derived from one known ancestor, the controls having identical heredity and environment with the experimental individ-

uals. The following substances were fed: desiccated thyroid, thymus, pituitary body, adrenals, pancreas and commercial iodothyrin and iodin. Among others the following results were obtained:

"Thyroid substance fed to Paramaecium aurelia or caudatum, either as emulsion of raw thyroids or as a suspension of the commercial powder, produces a constant and significant increase of 65 per cent. in the rate of division over that observed in the common laboratory medium—hay infusion. The thyroid is the only one of the internally secreting glands that produces this effect. Boiling the thyroid produces no change in the reaction. Iodothyrin and iodin fail to produce the thyroid effect. Paramaecia after prolonged thyroid treatment revert to the normal division rate when returned to the control medium. Paramaecia ingest and digest particles of the thyroid. It is suggested that the results of thyroid feeding here noted are due to the presence of a remarkably stable hormone in the thyroid which may be classified among the 'dissimilatory' hormones."

These results in conformity with those of various other recent researches indicate that thyroid substance is a highly potent general stimulant. It should be given a thorough systematic trial in practical therapeutics in cases where a general metabolic stimulant is needed, both alone and in connection with the various recognized "tonics."—R. G. H.

(ADRENIN.) The Mechanism of Cardiac Acceleration by Warmth and Adrenalin. Evans (C. L.) Jour. Physiol. (Lond.) 1917, li, 91.

Evans and Ogawa have shown that when a range of temperature of 7° was studied, the oxygen consumption by the beating heart varied directly as the pulse rate, or, in other words, the oxygen consumption per heart beat remained constant. Adrenalin in small amounts accelerates the heart, but there is no such constancy in gaseous metabolism as was observed in the case of temperature. More oxygen per beat was required when the heart was accelerated by adrenalin. The present paper is a continuation of these studies, and the conclusion is reached that the increased metabolism caused by adrenalin is apparently due to a direct and specific effect in increasing and accelerating the chemical changes associated with contraction.—T. C. B.

(PARATHYROIDS.) Does Parathyroidectomy in the Dog Affect the Blood Coagulation Time? Simpson (S.) and Rasmussen (A. T.) Quart. Jour. Exp. Physiol. (London) 1916, x, 145.

The problem was to ascertain if removal of the parathyroids (and incidentally the thyroid) would lead to any change in the coagulation of the blood, as might be expected if the ionic calcium content of the blood were affected by this operation. The graphic method of Cannon and Mendenhall was used to determine the coagulation time. The authors find that coagulation time in dog's blood varies considerably, not only in different individuals, but in the same individual from time to time. The removal of the thyroid and parathyroids does not appear to have any distinct effect on the coagulability of the blood, either before the onset of tetany or immediately succeeding it.—T. C. B.

(ADRENIN) The Epinephrin Content of the Blood in Conditions of Low Blood Pressure and Shock. Bedford (E. A.) Am. Jour. Physiol. (Balt.) 1917, xliii, 235.

The investigation was undertaken to determine the activity of the adrenals during shock produced by handling the intestine, by hemorrhage and by occlusion of the inferior vena cava. Strips of rabbit's intestine were used to indicate variations in the amount of epinephrin in the blood drawn from the vena cava close to the entrance of the adrenal vein.

The general conclusions to be drawn from the experiments are as follows: Increased quantities of epinephrin are thrown into the blood during conditions of low blood pressure and shock. This increase is due to a hyper-activity of the gland, and not simply to a release of epinephric material stored in the gland. The epinephric content of the blood increases only after a prolonged continuation of the conditions leading to shock. The quantity of epinephric material in the blood increases with prolongation of the period of low pressure and shock. The increased output of epinephrin into the blood may be a last effort of the organism to resist the forces that are tending toward a fatal degree of low blood pressure.—T. C. B.

ADRENIN, Effects of, on Distribution of Blood. II Volume Changes and Venous Discharge in the Spleen. Hoskins (R. G.) and Gunning (R. E. L.) Am. Jour. Physiol. (Balt.) 1917, xliii, 298.

A continuation of the studies begun in 1916, and abstracted in this Journal, Vol. I, p. 60.

The authors find that all effective dosages of adrenin cause a brief dilatation of the spleen, followed by contraction. This occurs whether the adrenin is injected instantaneously or by infusion. In no case was pure dilatation observed. The threshold for splenic contraction is lower than for changes in

arterial pressure. There is a brief increase of flow from the splenic vein, followed by a decrease.—T. C. B.

ADRENIN, Effects of, on Distribution of Blood. III Volume Changes and Venous Discharge in the Kidney. Hoskins (R. G.) and Gunning (R. E. L.) Am. Jour. Physiol. (Balt.) 1917, xliii, 304.

Adrenin in both pressor and depressor doses causes contraction of the kidney in dogs, and a corresponding decrease in the venous outflow. The results are the same whether the injections are instantaneous, or by the slower infusion. The threshold for renal changes and for blood pressure changes is about the same. The observations do not support, but also do not definitely disprove, the theory that in normal animals adrenin diuresis is due to renal dilatation.—T. C. B.

(ADRENIN) Further Observations on the Differential Action of Adrenalin. Hartman (F. A.) and McPhredran (Lois) Am. Jour. Physiol. (Balt.) 1917, xliii, 311.

In the experiments reported in the Am. Jour. Physiol., 1915, xxxviii, 438, Hartman found that adrenalin acted differently on the splanchnic circulation and the peripheral circulation. The present work is an attempt to arrive at some conclusion as to the mechanism involved in the vascular adjustment caused by this differential action. The authors find that small doses of adrenalin cause constriction of the vessels of the intestine, the kidney, and generally of the spleen. The minimal dose necessary is of the same order of magnitude as that required to cause a fall of blood pressure, but not necessarily identical with it, nor is it the same for every organ in the same animal. Increase in the dose of adrenalin causes in all cases marked dilatation of the intestine, but the dose is materially less than that necessary to bring about a rise of blood pressure. This dilatation is under the control of the central nervous system. In all doses adrenalin usually has a constrictor effect upon the spleen.—T. C. B.

(OVARY.) Observations on the Influence of Isolated Ovaries on the Body Growth of the Albino Rat. Stotsenberg (J. M.) Anat. Rec. (Phila.) xii, 259.

In earlier papers it had been shown that removal of both ovaries from young rats caused an over-growth of the body, and that after removal of one ovary, the other hypertrophied and checked all tendency toward over-growth. In the present paper one or both uterine horns and one ovary were removed from young rats. The loss of the uterine horns had

no effect on the body weight nor did that of one ovary. Ovaries that were quite pathological and single ovaries (hypertrophied) alike inhibited over-growth. Hence the author concludes that the ovaries probably exercise their control of growth through some other member of the endocrine system.—E. R. H.

(OVARY.) Oestrus and Ovulation in Swine. Corner (G.) and Amsbaugh (A. E.) Anat. Rec. (Phila.) 1917, xii, 287.

In the pig ovulation occurs on the first or second day of oestrus, and is independent of coitus. The mature unfertilized ovum is 155 to 165 micra in diameter and contains much fat. Fertilization occurs in the uterine tube.—E. R. H.

HYPOPHYSIS, Effects of Inanition and Refeeding upon the Growth and Structure of, in the Albino Rat. Jackson (C. M.) Amer. Jour. Anat. (Phila.) 1917, xxi, 321.

Preliminary account abstracted elsewhere.—E. R. H.

(HYPOPHYSIS.) Effects of the Extirpation of the Anterior Lobe of the Hyophysis of Rana Pipiens. Allen (B. M.) Biol. Bull. (Lancaster, Pa.) 1917, xii, 293.

Preliminary account abstracted elsewhere.—E. R. H.

(ADRENIN) The Adrenalin Content of the Suprarenal Capsules in Bubonic Plague. Ragazzi (C.) Arch. Farm. Sper. 1916, xxi, 244.

The disappearance of adrenalin as a result of infection with bubonic plague is not due to a chemical reaction between adrenalin and a toxin, but is an index of histological insufficiency of the organ due to direct lesion of the cell and to bacterial destruction of the parenchyma.—(Chem. Abstr.)

(ADRENIN) Sugli effetti delle iniexioni sottocutanee ed endovenose di adrenalina nei cani. The Effects of Subcutaneous and Intravenous Injection of Adrenalin in Dogs. Cosentino (G. C.) Arch. Farm. Sper. 1916, xxi, 400.

Subcutaneous and intravenous injection of adrenin (1-4 mg.) does not invariably cause glucosuria, and never causes pentosuria. It diminishes diuresis, reduces nitrogenous metabolism and increases phosphorus metabolism. It produces no alteration in the kidneys, but causes severe disturbances in the gastro-intestinal organs.—(Chem. Abstr.)

(ADRENIN) The Time of Appearance of Adrenalin in the Suprarenal Capsules of the Fetus. Cevolotto (G.) Atti. r. Ist Veneto (Venice) 1916, lxxiii, 1159.

The suprarenal capsules of ox, sheep, pig, and human fetuses were extracted with five times their weight of Ringer's solution. The presence of adrenin was tested biologically on the isolated mammalian heart, which is just as sensitive as the frog eye, or strips of arteries, uterus or intestine, the minimal quantity thus detected being 1:40,000,000. The results showed that adrenin is formed before the middle of pregnancy. The earliest time of appearance of the hormone was not determined.—(Chem. Abstr.)

(ADRENALS) Effect of Fasting on the Suprarenals. Pellegrini (R.) Atti. r. Ist. Veneto (Venice) 1916, lxxii, 781.

During fasting there is always a diminution of intracapsular chromaffin bodies which however do not correspond in intensity to the specific reaction with chrome salts. At the beginning of fasting this diminution is accompanied by some hyperfunctioning, in the later stages by a lessened functioning and regressive phenomena in the medulla. There is no definite parallelism between these changes on the one hand and the duration of fasting and loss of weight on the other. When fasting animals are treated with daily injections of adrenin (1.0 mg.) they have a lessened resistance, the medulla is congested and hemorrhagic, and the intensity of chromaffin reaction is augmented.—(Chem. Abstr.)

(PANCREAS) The Metabolism of d-Glucose in Surviving Organs. II. The Action of the Pancreas on d-Glucose Circulated in it. Artom (C.) Atti accad. Lincei, 1916, xvx, 466.

In continuing the systematic study of d-glucose metabolism in the various organs Artom has made perfusion experiments with the pancreas of dogs owing to its double importance in the fate of carbohydrates in the body. No earlier perfusion experiments were found but a large amount of work has been done on the action of pancreas pulp or pancreas Buchner press-extracts on d-glucose. This work is reviewed; the discrepancies are such that Artom can form no clear conception of the role of pancreas toward d-glucose. It was thought that perfusion experiments with the pancreas, like those with intestine, would give some clear results. The results showed: (1) That in perfusing a pancreas of a dog with defibrinated blood containing d-glucose there is always a diminution of the reducing power of the blood that varies from case to case (max. about 50 per cent.). (2) The carbohydrate content of the pancreas is generally increased by circulating with blood but at most this only accounts for 55 per cent. of the d-glucose lost from the blood. (3) When

d-glucose is perfused through the pancreas of a dog in Tyrode's solution there is always a reduction in the reducing power of the solution that varies from case to case but is generally much less than that obtained with blood; it does not exceed 24 per cent. (4) The carbohydrate content of the pancreas increases in perfusions with Tyrode's solution but such increases are less than the corresponding loss of d-glucose from the solution; they amount to about 85 per cent. of this loss. Thus the pancreas, like the intestine, consumes more d-glucose when it is perfused in blood than in Tyrode's soultion. The difference, however, is not great nor so constant. The pancreatic tissue is less resistant, less vital than intestinal tissue and it is harder to maintain its cellular elements in their full state of functional integrity under these conditions. It is safe to conclude in general that the isolated pancreas is capable of destroying d-glucose dissolved both in blood and in Tyrode's solution independently of the numerous other elements present.

(SPLEEN) The Metabolism of d-Glucose in Surviving Organs. III. The Action of the Spleen in d-Glucose Perfused Through It. Artom (C.) Atti accad. Lincei, 1916, xxv, 513.

The considerable volume of this organ, its function (still obscure in part), its richness in leucocytes which undoubtedly have an intense glycolytic activity and its relations to the glycogenic functions of the liver shown by the increase of hepatic glycogen after splenectomy (Verdozzi, Chem. Abstr. xi, 1455) were all considerations that made the artificial perfusion experiments such as the above of much interest. The few earlier experiments having a bearing on this subject are reviewed. The results of Levene and Meyer (Chem. Abstr. vii, 1204) showed no glucolytic action by themselves but gave a positive result when mixed with similar preparations from muscles, lungs, liver and pancreas. The methods used were the same as before. The results showed: (1) That in perfusing the spleen of a dog with blood containing d-glucose there is always a diminution in the reducing power of the blood, a diminution that varies from case to case and that may reach 25 per cent. (2) The carbohydrate content of the spleen generally increases in circulating with blood but not to the extent that corresponds to the d-glucose lost from the blood; it amounts to about 70 per cent. of the loss. (3) Perfusing d-glucose in Tyrode's solution through the spleen results in a diminution of the d-glucose content of the solution. (4) The carbohydrate content of the spleen also increases in the perfusion with Tyrode's solution, but it

is much less than the corresponding diminution of the reducing power of the liquid.—(Chem. Abstr.)

(THYMUS) The Partition of Phosphorus in Thymus Nucleic Acid. Hildegarde (C. G.) J. Biol. Chem. (Balt.) 1916, xxv, 189.

(PITUITARY) Tethelin as an Accelerator of Recovery of Weight Lost in Inanition, and in the Healing of Granulating Wounds. Robertson (T. B.) J. A. M. A. (Chgo.) 1916, lxvi, 1009.

See Endocrin., 1917, i, 24.

(GROWTH) II. Normal Growth of the White Mouse. Robertson (T. B.) J. Biol. Chem. (Balt.) 1916, xxiv, 363.

See Endocrin., 1917, i, 24.

(PITUITARY GROWTH) III. Influence of the Anterior Lobe of the Pituitary Gland on the Growth of the White Mouse. Robertson (T. B.) J. Biol. Chem. (Balt.) 1917, xxiv, 385.

See Endocrin., 1917, i, 24.

(PITUITARY GROWTH) IV. Influence of Tethelin, the Growth-controlling Principle of the Anterior Lobe of the Pituitary Gland, on the Growth of the White Mouse. Robertson (T. B.) J. Biol. Chem. (Balt.) 1916, xxiv, 397.

See Endocrin., 1917, i, 24.

(PITUITARY GROWTH) V. Isolation and Properties of Tethelin. Robertson (T. B.) J. Biol. Chem. (Balt.) 1916, xxiv, 409.

See Endocrin., 1917, i, 24.

(PANCREAS) Theory of Diabetes. VI. The Behavior of dl-Glyceric Aldehyde in the Normal and Diabetic Organism. Sansum (W. D.) and Woodyatt (R. T.) J. Biol. Chem. (Balt.) 1916, xxiv, 327.

(PANCREAS) Theory of Diabetes. VII. The Intravenous Tolerance Limit for dl-Glyceric Aldehyde, and the Improbability that it is a chief Intermediate in Glucose Katabolism. Sansum (W. D.) and Woodyatt (R. T.) J. Biol. Chem. (Balt.) 1916, xxiv, 343.

(THYROID) Iodin Compounds of the Human Thyroid. Wilson (L. B.) and Kendall (E. C.) Am. J. Med. Sci. (Phila.) 1916, cli, 79.

See Endocrin., 1917, i, 153.

(TESTIS) On the Influence of Castration in the Horse. Vermeulen (H. A.) Het paard ('s Gravenhage) 1917, xiii, 3.

Contains nothing new and proves that the effects of castration in the horse are absolutely the same as in other animals.—J. K.

THYROID Insufficiency and Cholesterinemia. Martinez (B. D.) Travaux du Laboratorie de Physiologie de la Faculte de Medicine de Buenos Aires, 1914, No. 16, 245.

On ten dogs with complete thyro-parathyroidectomy, of which nine died in from four to thirteen days, the author observed that during the 24 hours after the operation there was a diminution of the blood cholesterin but there was a subsequent increase in the quantity with the onset and development of the symptoms of tetany. The cholesterin was measured by the Grigant colorimetric method.—B. A. H.

SPLEEN, The Relation of, to the Secretory Function of the Stomach. Madero (L.) Travaux du Laboratoire de Physiologie de la Faculte de Medicine de Buenos Aires 1914, No. 16, 179.

Studies on dogs with Pawlow gastric fistulas are reported, in which extracts of the spleen and lymph glands in subcutaneous injections produced both an increase in the quantity of the secretion and in the concentration of the digestive units. Extracts of leucocytes and red cells produced the same effects. Splenectomy produced a diminution both of the secretion and the ferments, but this progressively emaciated the experimental animals. The author infers that the lymphocytes and lymphoid organs play a part in the production of the gastric juice and its enzymes.—B. A. H.

(PANCREAS) The Enzymic Action of Blood toward Glucose. IV. Enzymic Properties of the Blood of a Depancreatized Dog before and after Circulation (with Glucose) in the Intestine of the same Animal. Lombroso (U.) Atti accad. Lincei, 1916, xvx, 83.

Lombroso was especially interested in clearing up a contradiction in recent literature on this subject (Edelmann, Chem. Abstr. vi, 2104; Macleod, Chem. Abstr. vii, 3777). Edelmann maintains that the blood of the depancreatized dogs loses its glucolytic power, while Macleod maintains that it is not changed. Lombroso considers that Edelmann's experiments were not sufficiently prolonged and criticizes Macleod's

results because he failed to determine whether the glucose was condensed or destroyed. Verzar and Kraus (Chem. Abstr. vii, 3457) and Macleod and Smedley (Chem. Abstr. vii, 2597) conclude that the intestines of depancreatized dogs retain their power to utilize glucose in a Tyrode's solution. The technic was similar to that used before. The blood of a depancreatized dog shows a synthesizing power toward glucose nearly equal to that of normal blood. The glucolytic enzyme appears to be more or less diminished but not absent. It was observed that the greatest diminution in glucolytic power did not occur in the experiment in which the blood of a dog depancreatized for the longest time was used. The consumption of glucose dissolved in diabetic blood by the intestine of the same animal is much less in the same time interval than that observed with a normal intestine. The consumption of glucose in the intestine of the dog depancreatized for the longest time was least of all. The blood of depancreatized dogs circulated in the intestine of the same animal showed the presence of a very active glucolytic enzyme capable of destroying 10-15 per cent. of the glucose remaining in the blood after circulation in the first hour. The fact that the results vary from case to case is again emphasized. The general conclusions drawn are: (1) the blood of the depancreatized dog still possesses (although perhaps to a less extent) its glucolytic power and (2) that by circulating in the intestine of the same animal, this power is considerably increased.—(Chem. Abstr.)

THYROID Gland, Autotransplantation and Homotransplantation of, Using the Capsule as the Seat of Transplantation. Hess (J. H.) and Strauss (A. A.) Arch. Int. Med. (Chicago) 1917, xix, 518.

The authors believe that the transplantation of homotransplants as well as of autotransplants of certain highly specialized organs into regions normally occupied by such tissues is often possible and certainly worthy of trial. Their work justifying this conclusion was carried out on dogs and guinea pigs, three autotransplants and thirty-one homotransplants composing the series. They found that there should be as little disturbance as possible of the blood supply in the region where the transplant was placed, and suture material as well as all other foreign bodies should not come in contact with the transplant.

It was noticed that a familial relationship, as well as the early age of the animals on which the operations were performed, were probably important factors in their results

The statement is made, "That the varying degrees to which a homotransplant takes depend on the reaction between the host and the tissue transplanted and so far we have found no means either in the blood or in the thyroid gland itself by which we could determine the factor which produces this different condition in the various animals."

The report is well illustrated with micro-photographs made from sections of the transplants at various lengths of time after transplantation occurred.—W. B. T.

HYPOPHYSIS. Experimental Studies in the Frog. Houssay (B. A.) La Prensa Med. (Argent.) 1916, June 10, page 8.

The results of hypophysectomy in over 300 frogs (Leptodactylus Ocellatus) were published in 1910. Their hypophysis consists of three parts (glandular, pars intermedia and neurohypophysis). In the glandular part there are two types of cells, chromophile cells and non-chromophile cells. The hypophysis is not necessary to the life of the frog, for it was found possible to keep them alive for a long time following total ablation, providing they were not killed by the trauma of the operation. Extirpation of the glandular portion rarely caused death. With previous grafts the survival period of the frogs after hypophysectomy was increased. The vagus nerve retained its reflex excitability in the hypophysisectomized frogs. An extract of the hypophysis of the frog contains substances which slightly increase the arterial pressure and the energy of the heart, have a strong galactogogue action, increase the contractions in the esophagus of the toad, dilate the vessels of the kidney and produce diuresis.—B. A. H.

(ADRENAL) Nuovo contributo alla conoscenza del sistema cromaffine dei saurî Studi morphologici e eitologici sulla capsule surrenali con speciale riguardo al paragangli omonimi. Trinci (G.) Arch. ital. Anat. e di Embriol. (Firenze) 1916, xiv, 513.

A morphological and cytological study (embryological and comparative) of the suprarenal bodies in various species of amniotes. In different forms the relation of the cortex and medulla varies. The conditions vary from that in which the two parts are quite separate to that wherein the elements ot the two are intermingled. One often finds in the cortex of saurians, groups of chromaffine cells. Chromaffine masses are often found in the walls of the veins adjacent to the suprarenals. The suprarenal (medulla) may be considered as an extraordinarily developed chromaffine body (paraganglion)

forming an integral part of a longitudinal series. The cortex of the suprarenal (interrenal body) in different species, varies in structure, and varies with age, sex, season and physical condition. Two types of chromaffine cells exist, one is large, granular, has cell and nuclear boundary ill defined, stains deeply with basic stains, and has an intense chromaffin reaction. The other is smaller, paler, and has distinct cellular and nuclear membranes. The first constitutes the paraganglion substance. The second is in direct contact with the interrenal parenchyma, or scattered among its cords. Also there are present cells which are intermediate between nervous and chromaffine tissue. There is no change of nervous tissue into chromaffine tissue, but both come from the same anlage. The yellow color of the cortex is due to droplets of lipoid substance.—E. R. H.

(ADRENALS) The Nature of the Splanchnic Rise in Blood Pressure. Burton-Opitz (R.) and Edwards (D. R.) Am. Jour. Physiol. (Balt.) 1916, xli, 91.

When the splanchnic nerves are stimulated there is a two-stage rise in blood pressure. It was shown that when the fibres to all the splanchnic organs except the adrenals were sectioned the primary rise is practically abolished while the secondary rise persists.—R. G. H.

(PANCREAS) The Influence of Hypotensive Gland Extracts on Vasomotor Irritability. Beifeld (A. F.), Wheelon (H.) and Lovelette (C. R.) Am. Jour. Physiol. (Balt.) 1916, ~~1,~~ 40:360.

The data herein recorded were obtained in a study of the endocrine function of the pancreas. It was found that pancreas extract as well as salivary gland extract given by vein caused an augmentation of the vasomotor reaction to nicotine. The action is probably not specific.—R. G. H.

(THYROID) The Control of Experimental Cretinism. Basinger (H. R.) Arch. Int. Med. (Chgo.) 1916, xvii, 260.

The experiments were made upon thyroidectomized rabbits with controls from the same litters as the experimental animals. The operation was performed at the age of two to three weeks.

Author's summary: Transfusion of normal blood serum into cretins has no effect on the condition of cretinism. Transfusion of thyroid-fed animal's blood serum into other cretins is effective in increasing the growth and in controlling the other symptoms of cretinism. The improvement is not as

marked, however, as with thyroid feeding. Standard thyroid preparations (containing 0.2 per cent. iodin in organic combination), when given in carefully controlled non-toxic doses, will increase the growth of cretin rabbits and prevent the development of, or counteract, the other symptoms of cretinism. But thyroid feeding fails to carry an absolute cretin to full normal development. Discontinuing the thyroid feeding leads to a return of some of the cretin symptoms. The thyroid metaprotein of Koch is somewhat more active than standard thyroid preparations, but also more toxic. Kendall's thyroid extract "B" has no effect on any of the symptoms of cretinism. It is non-toxic, at least in ordinary doses. Cretins are more susceptible than the normal animals to the toxic action of thyroid (thyroid feeding). Cretin rabbits, despite their retarded rate of growth, continue to grow for a considerably longer time (four to six weeks) than the controls of the same litter.

(THYROID) Further Observations on the Overactivity of the Cervical Sympathetic. Cannon (W. B.) and Fitz (R.) Am. J. Phys. (Balt.) xl, 126.

In animals in which the phrenic nerve was grafted into the cervical sympathetic, symptoms of hyperthyroidism arose; particularly the basal metabolism was markedly increased. These symptoms disappeared on removal of the thyroid gland of the operated side.—R. G. H.

(PANCREAS) On the Relation of Blood-Sugar to Glycosuria in Diabetes Mellitus. Epstein (A. A.) Proc. Soc. Exper. Biol. and Med. (N. Y.) 1916, xiii, 67.

This paper is based upon an extensive study of diabetics, human and experimental. It was found that, contrary to general belief, there is a definite mathematical relationship between the percentage of sugar in the blood and that in the urine. The relationship does not hold, however, in individuals with defective kidneys.—R. G. H.

(THYROID. ADRENALS) The Thyroid-Adrenal Apparatus and Its Function in the Heat Regulation of the Body. Cramer (W.) Jour. Physiol. (Lond.) 1916, l, xxxviii.

The problem of heat regulation is one upon which physiologists have expended much study without reaching any very satisfactory conclusions. In these studies Cramer has brought the problem within the domain of endocrinology. He noted that exposure to cold and experimental hyper-pyrexia cause changes in the thyroid and adrenal glands and in the pyrexia studies disappearance of liver glycogen as well as constric-

tion of the vessels of the ear were noted. It is inferred that thyroid discharge is caused which in turn stimulates the adrenals leading to glycogenolysis in the liver and a general rise in metabolism with increased heat production. With sufficient adrenin discharge vaso-constriction and diminished heat loss, according to the author, will accompany this. Whether, as a matter of fact, sufficient adrenin could circulate to produce a significant cutaneous vaso-constriction without violently interfering with other functions is doubtful. Also, the simultaneous vaso-dilatation in the underlying muscles would seem to oppose this as a heat conserving mechanism—R. G. H.

(THYROID) Carbohydrate Metabolism in Experimental Hyperthyroidism. Cramer (M.) and McCall (R.) Proc. Physiol. Soc., Jour. Physiol. (Lond.) 1916, l, xxxvi.

The authors studied the effects of thyroid feeding upon the respiratory quotient in rats. This, they conclude, results in glycogen discharge from the liver and its oxidation with the food carbohydrate. Upon removal of the liver glycogen, carbohydrate is formed from protein and possibly from fat and this is also oxidized. Carbohydrate metabolism in hyperthyroidism indicates that the liver does not itself mobilize sufficient carbohydrate to cause glycosuria. The organism reacts to a discharge of carbohydrate into the blood by increased oxidation of the same. The "protein-sparing action of carbohydrate" is dependent upon the glycogenic function of the liver.—R. G. H.

DUCTLESS GLANDS, Studies of, by Electric Methods. Cannon (W. B.) Proc. Nat. Acad. Sci. U. S. A., ii, 319.

See Endocrin., 1917, i, 5, 58.

(DUCTLESS GLANDS) Some Results of Studies on Electrical Changes in Glands. Cannon (W. B.) and Cattell (McK.) Am. Jour. Physiol. (Phila.) 1916, xl, 143.

See Endocrin., 1917, i, 55.

(ADRENAL) A Study of the Involutional Changes Which Occur in the Adrenal Cortex During Infancy. Lewis (R. W.) and Pappenheimer (A. M.) Jour. Med. Research (Boston) 1916, xxxiv, 81.

As shown by Thomas the adrenal cortex undergoes certain involutional changes during early infancy, resulting in a separation of an inner degenerated strip of cortex from an intact outer zone. The degenerated cells are resorbed,

leaving their connective tissue intact. There is no regeneration of these cells during the first three years of life. One hundred cases were examined. Syphilis may have a retarding effect upon the involution of the cortex and infection seems to be associated with an increase in the width of the intact cortex, but prematurity and inanition do not have any noticeable effect upon the process of involution.—E. R. H.

(TESTIS) Size and Length Relations of the Right and Left Testis of Pigeons in Health and Disease. Riddle (O.) Anat. Rec. (Phila.) 1916, xi, 87.

The paper contains tables giving the weight and length of the testis of pigeons. The right testis is usually larger than the left but the variability is great. The ratio seems to be different in disease and hybridization, but the significance of this difference is not explained—E. R. H.

(OVARY) Further Developments in the Ovariotomized Fowl. Goodale (H. D.) Biol. Bull. (Woods Hole) 1916, xxx, 286.

Brown Leghorn females after castration developed male characters at first, then changed back toward the female type and still later the plumage again changed to the male type. Examination showed that the ovary had not regenerated, but instead a new organ had developed. The organ is neither testis or ovary. It is necessary however for the assumption of male plumage by females. In structure it is composed of groups of small cells separated by connective tissue. Some of the specimens examined contained also tubules lined with simple square cells. The organ may be developed from the Wolffian body. A more complete description is promised.—E. R. H.

(THYMUS) The Differentiation of Cells as a Criterion for Cell Identification Considered in Relation to the Small Cortical Cells of the Thymus. Danchakoff (V.) Jour. Exp. Med. (N. Y.) 1916, xxiv, 87.

The author states that the balance of recent work supports the theory of the true lymphoid nature of the small thymus cells. These cells arise from wandering cells of mesenchymal origin that invade the epithelial anlage of the thymus. These small lymphoid hemocytoblasts increase in number by their own mytotic proliferation and also at the expense of the large lymphoid hemocytoblasts and finally differentiate into small lymphocytes. The anlage of the small lymphocyte is a stem cell polyvalent in nature, and capable of forming granular leucocytes as well as lympho-

cytes. Experimentally small lymphocytes can be changed into plasma cells and granular leucocytes. The author holds that all blood cells descend directly or indirectly from a polyvalent cell which is merely a cell of the loose mesenchyma. The article is excellently illustrated.—E. R. H.

(PINEAL) The Reactions of the Melanophores of Amblystoma Larvae—the Supposed Influence of the Pineal Organ. Laurens (H.) Jour. Exp. Zool. (Phila.) 1916, xx, 237.

Among the numerous hypothetical functions attributed to the pineal body one advanced by Fuchs was that this organ has an inhibitory influence upon the movements of pigment in melanophores. Laurens was able to show that extirpation of the pineal body in amblystoma has no effect whatever upon these movements, they being controlled through the eyes. The significance of the pineal body has been so greatly overestimated that carefully performed experiments leading to negative results are especially valuable.—E. R. H.

(THYROID) Origin of the Chromophilic Colloid of the Thyroid Gland and Its Relation to Follicular Hemorrhages. (Origine de la Colloide Chromophile de la Glande Thyroide. Ses Relations avec l'Hemorrhagie Folliculaire.) Parhon (C. J.) and Enin (V.) C. R. Soc. de Biol. (Paris) 1916, lxxix, 502.

In certain thyroid glands coming from pathological cases one finds not infrequently follicles the contents of which deviate from the normal in the following respects: They are of a darker color; they give the impression of a substance more condensed than the normal colloid; and tinctorially they differ from the normal in that they take the hematoxylin in the hematoxlyin and eosin stain and the fuchsin in the van Gieson stain, whereas normal colloid is stained with eosin and picric acid, respectively.

This chromophilic substance indicates an abnormal thyroid gland. It is neither a special secretion of the gland, nor a physical modification of the normal colloid. And, from the latter, it has been shown to differ, also, chemically.

In an earlier report the authors came to the conclusion that the chromophilic material arose in great part from desquamated and degenerated epithelium. However, on the basis of the present research, the writers believe they have definitely shown the source of the dark colloid.

In a case of general paralysis of the maniacal type six injections of neosalvarsan (0.15-0.60 gm.) were given at

weekly intervals. A few days following the sixth injection the patient succumbed. A study was made of the thyroid.

In sections stained with hematoxylin and eosin and with van Gieson were observed many follicles filled with the chromaphilic colloid, and what was more striking, many also filled with blood. Between the two was found every transition. The writers were able to follow the transition step by step, from the red cell stage to that of the chromophilic colloid, both physically and tinctorially.

On the basis of this work, the authors have come to the conclusion that hemorrhages are the chief source of the chromophilic colloid, admitting, however, that leucocytes and desquamated epithelium may play a part. In support of the hemorrhage theory is the frequent presence of the unusual colloid in conditions in which convulsive seizures are common, namely, general paralysis and epilepsy.—A. F. B.

(ADRENALS) A Suprarenal Adenoma in the Mouse. Itami (S.) Proc. N. Y. Path. Soc., 1916, xvi, 45.

A description of the gross and microscopic appearance of an adenomatous tumor in a mouse. The tumor occupied the central region of the gland, was clearly defined and showed no tendency to invade the cortex. Itami thought the neoplasm originated from the medulla, although its cells did not give the chromaffin reaction.—J. P. S.

(THYROID) Further Observations on the Thyroid Gland. Edmunds (W.) Jour. Path. and Bact. (Cambridge, England) 1916, xxi, 23.

Edmunds reports the results of experiments on the effect of feeding milk and of administration of calcium lactate to thyroid- and parathyroid-ectomized dogs. In only six out of sixteen animals was the treatment successful. If this method is useful at all it generally succeeds in the first three months. After that the animal may live for months or even years on the milk with added calcium. From this it would appear that after a time some change occurs in the animal, and this would seem to be a compensating hypertrophy of the pituitary. It is necessary to give the calcium lactate in large amounts.—J. P. S.

CLINICAL STUDY

(ENDOCRINE GLANDS) Abderhalden Reaction in Mental Diseases. Cotton (H. A.) Corson-White (E. P.) and Stevenson (W. W.) Jour. Nerv. & Ment. Dis. (Lancaster, Pa.) 1917, xlv, 144.

This is a very interesting report, the object of which is to show the Abderhalden test can be of material assistance in psychiatry.

The technique of the test essentially followed that given by Abderhalden, with some improvements. The following substrates were used: Pituitary, thymus, thyroid, pancreas, adrenal and gonads (ovary and testicle), but no brain tissue was employed. The blood of the patients to be tested was always taken before breakfast and the test was made the same day within three hours after the blood was taken.

The most important findings were made in the groups of dementia precox and epilepsy. Other psychoses gave practically negative results; at least, the results did not warrant the drawing of any conclusion. The authors conclude from their findings that the results are practically negative except in dementia precox and epilepsy.

In dementia precox eighty-one per cent. of their fifty-eight cases tested gave a positive reaction to sex gland. Three cases out of fifty-five, two of these being of a catatonic type, gave a positive reaction to thyroid and sex. In connection with the Abderhalden test blood counts were made and wide deviations from the normal were noticed. There was usually a larger percentage of lymphocytes than polymorphonuclears present. In other psychoses the blood count was found approximately normal. The authors also mention the fact that seventy-five per cent of dementia precox cases die of tuberculosis, and the statement is made that possibly this large coexistence of tuberculosis and dementia precox justifies the hypothesis that the former stands in some etiological relation to the latter. Sixty-nine cases of epilepsy were examined. All were positive to the adrenal gland. The authors have treated these cases with pancreatin with considerable success.

The statement is made that the value of the report of these reactions is to lay the foundation for therapy based upon the facts deduced.

This report, though short, is of the utmost interest to all who are interested in psychiatry. The reviewer has personally observed the procedure in performing these tests and feels that every precaution has been taken against error in technique.—W. B. T.

SUPRARENAL Hemorrhage in Cerebrospinal Fever. Scott (S. G.) Lancet (London) 1917, cxcii, 4871.

Reporting the incidence of adrenal disorder accompanying meningitis and the autopsy findings as indicated in the title.—W. B. T.

(THYROID) Intrathyroid Injection of Boiling Water in Hyperthyroidism. Day (J. C.) Ann. of Surg. (Phila.) 1917, lxv, 279.

The author has treated seventeen cases of hyperthyroidism by the injection of boiling water into the gland tissue. Following this procedure, nothing but good has resulted, even in those cases first treated before the technique had been fully developed. He reports a death following this procedure by another physician, which he believes is a very unusual experience due to the critical condition of the patient before operating.

The author believes that when existing conditions are such that the patient is a fairly safe surgical risk partial thyroidectomy is the procedure of choice. After this period has passed other methods should be utilized with the object of bringing the sufferer back to the point where surgery can be safely applied. It is in these cases that the injection of boiling water will be of the greatest value. Some of the patients were so relieved following this procedure that they later refused an operation.

The object of the injection is to destroy a portion of a gland. During its destruction, piece-meal by successive injections of hot water, other beneficial measures should be instituted, such as rest, quiet and diet.

It is thought best to exercise a little tact, not allowing the patient to understand that boiling water is to be injected in order that the nervous system may not be thrown into a condition of extreme fright and the thyroid stimulated.

The patient is given morphine previous to the operation and the operation is usually carried out under local anesthesia.

That no fumbling may occur while the hot water is being injected, several pieces of rubber tubing are slipped over the barrel of a ten cc. syringe, which is to be used in injecting the boiling water. Two pairs of gloves are used, cotton inside of rubber, that the operator may be able to work without fear of burning his hands.

The water must be injected boiling; otherwise it will not be hot enough to cook the tissue. The injection must be systematic and a note kept of the place of each injection in

order that the same region may not be reinjected. Sometimes the gland is exposed and the cooking carried out under the eye. As this is done, the injected portion of the gland is seen to whiten into a bloodless, pulp-like mass.—W. B. T.

"THYROID Stone." Pennell (V.) Lancet (London) 1917, i, 454.

A case report of a man forty-five years of age who sought advice for aphonia of three months' duration. A laryngoscopic examination revealed a complete paralysis of the left vocal cord.

A small, hard lump was felt on the left side of the neck in the position normally occupied by the left lobe of the thyroid. It moved on swallowing and did not appear to be firmly fixed to its attachments. It was tender on palpation.

The thyroid was exposed and a rock-like mass was removed from the upper pole of the left lobe. It was slightly larger than a walnut and was tightly wedged between the thyroid and esophagus, pressing on the recurrent nerve of the left side.

This mass was found to be a calcified adenoma. It occupied the site of the superior parathyroid gland and probably originated from that gland.—W. B. T.

THYMUS, Tumors of, in Myasthenia Gravis. Bell (E. T.) Jour. Nerv. and Ment. Dis. (Lancaster, Pa.) 1917, xlv, 130.

Starr, reviewing two hundred and fifty cases of myasthenia gravis, noted a pathologic condition of the thymus in twenty-eight of the cases that came to autopsy. Of fifty-six autopsies published since then, the thymus was found to be enlarged in seventeen and in ten others it contained a tumor.

The author reports a benign thymic tumor from a typical case of myasthenia gravis. This tumor was composed of thymic tissue fetal in type, i. e., a dense epithelial reticulum with lymphocytes. The usual thymic rests were found in the adipose tissue around the growth.

The thymic tumors occurring in myasthenia gravis seem to form a distinct group unlike any other thymic tumors. These may be classified as benign thymomata.

The statement is made that some abnormality of the thymus is found in nearly half of the cases of myasthenia gravis.—W. B. T.

(THYROID) Notes on Military Surgery. Ney (K. W.) New Orleans Med. and Surg. Jour. 1917, lxix, 546.

This author incorporates in a report on military surgery the fact that a large number of cases sent to the European base hospitals from the firing line come there with a diagnosis

of general fatigue and tachycardia. These patients are sent in by the hundreds, and in many instances absolute rest in bed and digitalis fail to cause abatement of the symptoms.

Such patients can stand no exertion, and even while at rest the heart action is very rapid.

Many of these people remain in the hospitals for months, during which time they develop a gradual enlargement of the thyroid gland. Quite a few of them are relieved only after the ligation of one or more of the thyroid vessels or after the removal of a lobe of the thyroid gland.

These cases, the author believes, indicate a derangement of the ductless glands due to the emotions.—W. B. T.

PITUITARY Tumor with General Edema in Two Cases of Nanism, one each of the Paltauf and Pituitary Types. Kraus (W. M.) Jour. Nerv. and Ment. Dis. (Lancaster, Pa.) 1917, xlv, 193.

The case histories of two patients are reported.

The first is that of a man aged forty-eight, admitted to the hospital complaining of swelling of the hands, feet and face, a similar attack having occurred previously several years ago. The man was small in stature and quite active. On admission his temperature was 103.6° but this dropped to normal in two days. There was a leukocytosis of 19,000, of which seventy per cent. were polymorphonuclears. He did not complain of pain anywhere. Blood pressure: Systolic, 88; Diastolic, 64. X-ray examination of the head showed a large sella turcica. His sight is poor, particularly on the left, with which eye practically nothing can be seen. He eats a great deal of candy, buying it by the pound when he has the money. There has never been any sugar in the urine. He always feels very sleepy. Hands are very large, skin thick and pigmented on the dorsal aspect. The arms were exceedingly long—the span was sixty inches. Evidence of disease of the central nervous system consisted of impaired visual acuity, double neuro-retinitis with atrophy, contraction of the color fields, poor hearing on the right and a curious unsteady gait; no Romberg and no real ataxia. Mentally, the patient acted like a well behaved, obedient child, doing what he was told, always agreeable and simple in his ways. He was very sneaky but in a harmless manner; for example, he would steal crackers from the kitchen when no one was looking.

The second case history was that of a vaudeville actor, age thirty-seven years. He was brought into the hospital in semi-conscious condition, with a history of having been perfectly normal the previous day, but on being awakened he was confused and could not dress himself. On physical ex-

amination the patient was found to be a small male forty inches tall, with dry yellowish skin, devoid of hair except that of the head and eyebrows. Genital organs quite small. The day following admission the patient had fourteen convulsions. White blood counts showed 18,000 cells; ninety per cent. of these were polymorphonuclears. During the next few days following the admission some edema of the extremities developed. He vomited continuously. The patient died fifteen days following admission. The autopsy revealed a degenerated posterior lobe of the hypophysis.

There is little doubt that both of these cases are instances of arrested development, starting very early in life. The first patient was no taller than a thirteen year old boy; his weight was normal for an adult. He was of the pituitary type. The second patient was of the Paltauf type, that is, an individual of normal size at birth, developing normally at first but in whom during early youth growth was arrested.—W. B. T.

(PITUITARY) A Case of Infundibular Tumor in a Child, causing Diabetes Insipidus with Tolerance of Alcohol. Newmark (L.) Arch. Int. Med. (Chicago) 1917, xix, 550.

The author presents a concise but full case history of a boy who died at fourteen years of age after suffering from diabetes insipidus for a period of five years. No signs of tumor were found until about two weeks before death and the author for this reason admonishes the profession against assuming the functional nature of diabetes insipidus even after some years have elapsed without definite tumor symptoms.

Not only was there an immoderate thirst for water, there being no limit to the amount of water craved, but he also desired strong drinks. He would drink home-made wine from the barrel by sucking it up through a tube. When possible he would persuade some person, under one pretext or another, to buy whiskey for him; but his favorite drink was beer, which he would drink one glassful after another in rapid succession. It is said that after a drinking bout shared by another little boy, who evidently received a very small proportion of the four and one-half quarts of beer, he reported at school and performed his tasks well, as usual. He was never seen in the slightest degree intoxicated.

On autopsy a tumor was found occupying the region of the infundibulum, extending forward through the lamina terminalis between the frontal lobes and backward into the third ventricle, destroying the neurohypophysis and nearly all of the pars intermedia, which accounted for the diabetes insipidus. Pineal atrophy was also noticed.—W. B. T.

THYMUS, The Reactivated. Hoxie (G. H.) Arch. Int. Med. (Chicago) 1917, xix, 564.

The author presents a short case history of what is usually called "persistent thymus." He believes that the thymic parenchyma persists throughout life and that this parenchyma may become reactivated and its secretion influence the hormopoietic system. The causes of such a reactivation are not known. He suggests as the best term to describe this case "Thymic Myasthenia."

The history is that of a farmer, age nineteen, who had been suffering for two years previously with shortness of breath. He showed great loss of weight and slept badly. The temperature was quite labile and was easily raised by emotional and physical excitement. The most important physical finding was increased submanubrial dullness. The roentgenogram of the chest showed an enlarged shadow in this area. The manubrium was resected and pieces of thymus removed. The pathologist reported that sections of this showed characteristic reactivation of the thymus gland.—W. B. T.

(PITUITARY) Contribution to the Symptom Complex Associated with Interpeduncular Tumors. Gosline (H. I.) Jour. Nerv. and Ment. Dis. (Lancaster, Pa.) 1917, xlv, 337.

An interesting case of pituitary tumor of considerable clinical and practical interest is reported. A man thirty years of age suffered from active symptoms of eight months' duration which were characterized by drowsiness of such persistence that he lost several positions. He died with signs of interpeduncular tumor.

On autopsy the tumor was found to be composed of undifferentiated anterior lobe cells such as are found in hibernating animals, and the suggestion is made that there may be some correlation between tumors of this sort and the possibility of human hibernation.

It is interesting to note that there was a high incidence of twins in the immediate family of the patient. His organs showed fetal lobulations and other variations from the normal.—W. B. T.

(PITUITARY) A Case of Dyspituitarism with Heart Block. Packard (M.) Jour. Nerv. and Ment. Dis. (Lancaster, Pa.) 1917, xlv, 362.

ADRENAL, Congenital, Intracranial. Meyer (A. W.) Anat. Rec. (Phila.) 1917, xii, 43.

The author found in a man an accessory adrenal body within the cranium lying upon the accessory nerve.—E. R. H.

OVARY, Human Graft of, in Exophthalmic Goiter. Celesia (F.) La Prensa Med. Argentina, 1914, i, 91.

The patient exhibited tachycardia and tremor. Her menses were irregular. After an ovarian homograft she felt better and the menses returned. The ovary was ultimately resorbed.

B. A. H.

(THYROID.) Exophthalmic Goiter, Surgical Treatment of. Chutro (P.) Meeting of the Argentine Medical Association, May 17, 1915.

Chutro advises the Porter treatment (injection of boiling water) and ligature of the thyroid vessels as the sole operation or as a preliminary treatment.—B. A. H.

HYPOPHYSIS, Tumor of, with Ocular Symptoms. Noceti (A.) and Houssay (B. A.) Revista de la Sociedad de Oftalmologia de Buenos Aires, 1914, No. 1.

The patient had neither dystrophia nor sexual hypofunction. He showed slight adiposity and bitemporal hemianopsia. The X-rays disclosed a tumor outside of the sella. He was operated upon by Hirsh (Vienna). His syndrome remained the same during one year, during which he complained of epistaxis and symptoms of cranial hypertension and then he became blind.—B. A. H.

DWARFISM, A Case of. Bordot (E.) and Ovidio (R.) Assoc. Med. Argent. (Bs. Aires) 1916, xxiv, 329.

I. L., six years old, is the son of Spanish parents, both healthy. Paternal history includes neither alcoholism nor syphilis. Mother gave a positive tuberculin skin reaction but has always felt well. Grandfather and mother were healthy.

The boy was born healthy, 5500 grams in weight and nursed until fourteen months old. His first tooth appeared at four months. He began to walk at nine months and to speak when one year old; he had complained of nothing but dyspepsia. Since his eighth month he has increased neither in weight nor height.

Present condition: weight, 8600 grams; temperature, 37 C; the sutures of the cranium solid; lungs and heart normal; pulse 100 per minute. The teeth are for the most part carious. Stools are normal; spleen and liver normal. Cryptorchidism is present. Boy is intelligent, speaks very well, is lively and joyful. All the measures of his extremities correspond to his stature, however the cranial belongs to a boy of 4 or 5 years.

The X-ray of the cranial base showed a sella not enlarged, and without deformities. The authors believe that the case is of tuberculous origin.—G. P. G.

(THYROID) The Basedow Syndrome at the Beginning of Puberty. Catalan (E.) La Prensa Med. Argentina, 1915, ii, 321.

All the symptoms of Basedow's disease (pulse 160, slight exophthalmos, thyroid tumor, tremor) appeared when the menstruation began. The subject was very nervous. These symptoms remained during three months and then she was able to resume her studies.—B. A. H.

PARATHYROIDS, Carcinoma of, with Metastasis Simulating an Aneurism of the Arch of the Aorta. Roffo (A. H.) and Landivar (A. F.) La Prensa Med. Argentina, 1914, ii, 177.

Describes a case of an Italian, 60 years old, who had two large tumors on the left side of the neck and on the superior part of the sternum. Histologic study proved them to be lobular carcinoma with cytologic characteristics of the chief cells of the parathyroids. In the early stage the tumors were benign but at the end they became malignant and the man died. An autopsy was made.

(Illustrated with photographs and micro-photographs.) B. A. H.

ADRENALS in Normal and Pathologic Pregnancy. Gabastou (J. A.) La Prensa Med. Argentina, 1915, ii, 346, 358, 371, 382, 395, 408.

The constant presence of fat vacuoles in the medullary part of the adrenals was noted throughout pregnancy. The vaso-constrictor action of the serum was determined by the Laewen-Trendelenburg method. A positive test was obtained with the serum of twenty pregnant women; at parturition only one of six cases was positive and during the puerperium none. By the same method it was found that the adrenin was increased in the adrenals of pregnant bitches. The serum of eclamptics gave a negative reaction.—B. A. H.

(O'Connor and Stewart have shown that all sera contain vaso-constrictor substances other than adrenin, hence the evidence cited is not conclusive.—Editor.)

ADRENALS, Sarcoma of. Elizalde (P. T.) Assoc. Med. Argent. (Bs. Aires) 1916, xxiv, 309.

At autopsy there was found a sarcoma in the right adrenal and metastases in the left adrenal, pancreas and liver. The patient had been operated upon for obstruction of the systic duct accompanied by enlargement of the liver and spleen.—G. P. G.

(THYROID) Goiter in a Girl Five Years Old. Iorge (I. U.) Assoc. Med. Argent. (Bs. Aires) 1916, xxv, 231.

Among 47,200 ill children from the Pediatric Clinic of the Clinical Hospital, only this case was found. The nodular part of the gland was removed. Thirteen days after the operation the patient was discharged. Histologic study showed the presence of two types of tissue. The neoplasm was an adenoma with the histologic features of exophthalmic goiter and the remainder of the tissue resembled the thyroid of an adult.—G. P. G.

(PINEAL) The Relation of Muscular Dystrophy to Disturbance in the Internal Glandular System. Timme (W.) New York Neurological Society, Dec., 1916.

The speaker reported a series of cases of progressive muscular dystrophy occurring in one family through three generations, with detailed examination of one of these cases and X-ray examination of the skull and other parts in five cases. These skiagraphs showed indubitable evidence of a diseased endocrine system, notably in the pineal gland. From his observations he concluded that the relationship between pineal gland disease and progressive muscular dystrophy was undoubtedly a very close one—E. M. A.

(AUTONOMIC NERVOUS SYSTEM) The Relation between Over-activity of the Vagus System and Anaphylaxis. Smith (J. H.) Jour. Nerv. and Ment. Dis. (Lancaster, Pa.) 1917, xiv, 26.

A clinical study of the vegetative nervous system and anaphylaxis, from which the author concludes that anaphylaxis manifests itself chiefly through vagus irritation, and further states that in the interpretation of vagotonic symptoms (sweating, increased salivary secretion, hyperacidity, nervousness, embarrassment of respiration, constipation, bradycardia, etc.) without apparent cause, two toxic factors are among the possibilities, ductless gland disturbances and chronic bacterial infection. In these two groups the most important are thyroid intoxication and tuberculosis.—E. M. A.

(THYROID) Quinine and Urea Injections in Hyperthyroidism. Watson (L. F.) New York M. J. 1916, ciii, 791.

See Endocrin., 1917, i, 178.

(THYROID) Some Conditions Controlling Thyroid Activity. Cannon (W. B.) and Cattell (McK) Boston M. & S. J. 1916, clxxiv, 138.

See Abstract, Endocrin., 1917, i, 55.

THYROID and Heart Disease. (Thyrogene hartstoornessen.) Enthoven (T. H.) Nederlandsch Tijdschrift voor Geneeskunde (Amsterdam) 1917, lxi, 1461.

The author examined the hearts of 100 patients with goiter. Fifteen suffered from compression of the trachea. Five of these had perfectly normal hearts; ten others showed a rapid pulse (about 160). These ten patients were more than 24 years of age; the other five were younger. The youngest of all, however, a boy of 17 showed the most rapid pulse.

Forty-two patients without compression of the trachea showed a rapid pulse and sometimes heart failure. It is remarkable that the most serious heart failures were observed in cases in which the goiter was small.

Forty patients showed no heart symptoms. Three patients with goiter showed an enlargement of the heart without high blood pressure heart failure.

In cases in which heart symptoms are influenced by rest it will be necessary to examine the thyroid.—J. K.

(THYROID) Goiter, Cretinism and Chagas' Disease. Kraus (R.), Maggio (C.) and Rosenbusch (F.) La Prensa Med. (Argent.) 1915, Nos. 1 and 2.

Chagas has described in Brazil, a thyroid infested with Trypanosoma Cruzi, which is transmitted by eriatoma megista. The vinchucas of Argentine (eriatoma infestans, Klug) contains the evolution forms of Trypanosoma Cruzi and infects mice, guinea-pigs, rabbits and dogs. The trypanosome appears in their blood, heart and other organs and in the parasitic cysts. No active case of Chagas' disease in man has so far been found in Argentine. The vinchucas infection has been found not alone in the provinces where goiter exists, but also in other and distinct places. The authors believe that the clinical difference which exists between Chagas' disease and goiter, infantilism and idiocy, associated with goiter and endemic cretinism such as is found in Europe, is not conclusive. The authors consider the etiologic relation of the trypanosome with endemic goiter. They do not deny the existence of the acute form of Chagas' disease.—B. A. H.

(THYROID) Clinical Aspects and Pathological Anatomy of the American Trypanosome. Chagas (C.) La Prensa Med. (Argent.) 1916, Nos. 13, 14, 15.

Three complete studies of Chagas' disease. The author attributes to the trypanosome the large number of cases of goiter which are observed in certain regions of Brazil.

(THYROID) Cretinism and Chagas' Disease. (Second communication.) Kraus (R.) and Rosenbusch (F.) La Prensa Med. (Argent.) 1916, No. 17.

The authors believe that the endemic goiter of the province of Salta is produced by the trypanosome. They found Eriatoma infestans, the transmitting insect, capable of producing trypanosomiasis in guinea pigs, not only in goiterous regions, but also in other distant places. They believe that Chagas' disease does not differ greatly from the classic cretinism.

In Salta they have found goiterous and cretin dogs. They believe that the goiter and cretinism of Argentine are identical with those of Europe.—B. A. H.

(OVARY) Pathogenesis of Uterine Fibromata. Piccardo (F. J.) La Prensa Med. (Argent.) August, 1916, 65.

The author attaches great importance in the development of fibromata to hyperfunction of the ovaries which he attempts to check by thyroid medication.

(INFANTILISM) A Case of, Associated with Stone in the Kidney. Tuechter (J. L.) Lancet-Clinic (Cincinn.) 1916, cxv, 483.

The author reports a case of infantilism associated with stone in the kidney. Of no particular endocrine interest.

J. R. G.

(THYMUS) Two Cases of Enlarged Thymus. Skaggs (C. S.) Lancet-Clinic (Cincinn.) 196, cxv, 246.

The author reports two cases in which the symptoms point to thymus enlargement. He first reviews the literature and divides cases of enlarged thymus into three classes: (a) those showing thymic striae, (b) those with thymic asthma and (c) those with thymic death. The first child died suddenly with typical symptoms but he was unable to obtain post-mortem. The second child, after a history of considerable exposure, developed a wasting illness associated with attacks of coughing, resembling whooping-cough. The X-ray showed a shadow in the thymus region. No post-mortem was obtained.

The reviewer is not quite able to understand how this last case can be attributed definitely to enlarged thymus. From such a description, one would be justified in suspecting tuberculosis with pressure symptoms from enlarged bronchial glands.—J. R. G.

(HYPOPHYSIS) Teratoma in the Region of the Tuber Cinerum. Bosco (G. A.) La Prensa Med. (Argent.) 1915, No. 18, 249.

Observations together with autopsy and microphotographs. Illness of one year's duration with loss of attention and memory. Intense headaches, vomiting, diminishing vision in the right eye, incomplete right sided hemiplegia, papillary atrophy complete on the right and incomplete on the left side. The tumor was cystic, arising in the third ventricle and extending to the corpora quadrigemina. On microscopical examination, the structural part of the tumor was found to be made up of cords of cuboidal cells and the cystic cavities were filled with colloid.—B. A. H.

THYROID SECRETION, A Slight Insufficiency of, in Gynecology. Castano (C. A.) La Prensa Med. (Argent.) 1915, Nos. 5-6, 81 and 89.

A resumé of the results of thyroid medication in various gynecologic cases. The author advises such medication in cases of severe hemorrhage which are not due to lesions in the genital tract. Its administration was found efficacious in certain cases of dysmenorrhea and in a few cases of leucorrhea; also in cases of repeated abortion which could not be proven to be due to another cause.—B. A. H.

(THYROID) Exophthalmic Goiter and Abnormal Growth. Busio (J.) Sociedad Argent. de Pediatria., Aug. 31, 1915. La Prensa Med. (Argent.) 1915, 177.

Case: A girl, 13 years of age, without menstruation. For two years she suffered from pains in the joints with swellings of 10 centimeters at each attack. In the last attack there was evidence of goiter and of tachycardia. The mother is very nervous and an uncle had suddenly increased in growth at the age of 14. The patient has grown 50 centimeters in height since the beginning of her attacks.

In the discussion, Dr. Elizalde mentioned an analogous case of a girl 9 years old who did not have a goiter. Her mother did however have a goiter.—B. A. H.

HYPOPHYSIS, Clinical Considerations of Some Lesions of. Priana (P.) La Prensa Med. (Argent.) 1916, No. 35, 411.

Two cases of acromegaly and one case of adiposity with bitemporal hemianopsia are reported. One case of acromegaly was operated but at the end of a month, the patient developed symptoms of meningitis and died. At autopsy a large adeno-carcinoma of the hyophysis was found (100 gms.).

The case of adiposity with bitemporal hemianopsia was operated and died from acccidental hemorrhage from the lateral sinus.—B. A. H.

A Case of Ateliosis. Webber (E. P.) and Stebbing (G. F.) Brit. J. Child. Dis. (Lond.) 1916, xiii, 200.

The authors' report of the case of ateliosis in a boy 16 years of age. This name is given by Hastings Gilford to a kind of general and symmetrical dwarfism and infantilism, due to more or less complete bodily and mental arrest of growth and development. It is not confined to the head or limbs but involves the whole body; that is, a microsomia. The cases differ from each other according to the stage of growth and the time at which the arrested development occurs. These cases are of probably endocrine interest because they show (a) hypoplastic sexual glands, (b) very small thyroid and (c) the X-ray picture shows a very small pituitary fossa. The boy described was 109 centimeters in height and weighed 22 kilograms. The abdomen and head were large, conforming to infantile proportions; thyroid was not palpable; the sexual organs resembled those of a child of five and ossification seemed normal. The condition was first noticed at the age of four years. As regards therapy, thyroid extract had no effect.—J. R. G.

(PITUITARY) A Case of Dyspituitarism. Pou (R. E.) Lancet-Clinic (Cincinn.) 1916, cxv, 88.

A good clinical report.

(SPLEEN, ADRENALS) A Study of the Lipin Content of a Case of Gaucher's Disease in an Infant. Wahl (H. R.) and Richardson (M. L.) Arch. Int. Med. (Chgo.) 1916, xvii, 238.

While not of technical endocrine interest, the article is worthy of careful consideration; the authors' review of the literature shows a gradual increasing tendency of observers to ascribe the large pale cells to lipoid infiltration. In their case, the spleen, liver and lymph nodes presented the usual changes and in addition, the almost complete substitution of the medulla of both adrenals by clusters of large, pale, vacuolated cells.

Microchemical study showed not only this accumulation of lipoid in the large pale cells but revealed also that these bodies were not identical. These lipoids are not definitely proven to be cholesterin and so it is safer to refer to them, as yet, by the more general term. Why in this case the

medulla of both adrenals was almost replaced by large cells is difficult to explain. Krylow believes that the adrenal cortex regulates lipoid metabolism. The authors conclude that in Gaucher's disease the liver and spleen show not only a marked increase in lipin, but also a serious alteration in the relation of lipins to each other. Fixed fats are greatly reduced while lipoids, such as cholesterin, are greatly increased.—J. R. G.

(DYSPITUITARISM) Two Cases of Dyspituitarism, Particularly of the Posterior Lobe. Niles (W. L.) Med. Record (New York) 1916, lxxxix, 6.

The author gives a good review of the literature, showing that most studies confirm Cushing's ideas, namely: that the two parts of the gland are antagonistic to each other, the anterior part influencing skeletal development; the posterior part being related to metabolism, chiefly, of carbohydrates. Functional hyperplasia of the anterior part gives gigantism if it exists before the completion of the epiphyseal union. Afterwards, it gives acromegaly. Insufficiency of the posterior part gives adiposity and an increased tolerance for carbohydrates. One case is of interest. A boy, aged 13 years, had a large appetite, particularly for carbohydrates; was always cold (the temperature ranging around 96 degrees), showed polyuria, fainted occasionally and was emotional. The examination showed feminine configuration of the body: broad hips and thighs, tapering extremities, small hands and feet, the skin was dry and coarse, there was no hair other than that on the scalp, the X-ray showed a very small sella turcica. The interesting feature in the case was the improvement under treatment. The food intake was reduced to 24 calories per kilogram and he was given grains 1-10 of a posterior lobe of pituitary t. i. d. by mouth. Temperature rose at once to 98 degrees but after two weeks began to sag. Upon doubling the dose, the temperature again rose to 98. Two months later, upon stopping the treatment, the temperature dropped one degree, becoming normal again, however, upon resuming the pituitary feeding. After four months, he was better in every way. He led in his class in school and everybody noticed his improvement.—J. R. G.

(HYPOPHYSIS) Les tumeurs de l'hypophyse (Pituitary Tumors). Hutinel (P.) Rev. Gen. de Clin. et de Therap. (Paris) 1916, xxx, 81.

The author describes a case of a girl of 13 years, with all symptoms of tumor of the hypophysis. Remarkable is the

fact that all of her symptoms disappeared following a decompression operation, except nystagmus and amaurosis. Two years later the reflexes were normal, there was no Koenig, no contracture, no hemiplegia; obesity disappeared and there were no increased signs of acromegaly. Such a report suggests that it might be advisable to try a palliative operation first before doing one more radical.—J. R. G.

(ADRENALS) Addison's Disease, with a Report of Two Cases. Goodwin (R. A.) Providence Med. J. 1916, xvii, 33.

The author reviews the literature of adrenal physiology and says that Addison's disease is now considered an affection of the entire chromaffin system. This is tissue having a special affinity for chrome salts. It is found along the vertebral column in the embryo and it becomes the medulla of the adrenal, the carotid gland in the arch of the aorta, the coccygeal gland and is found along the course of the sympathetic nerves. In Addison's disease, all of this tissue seems involved and particularly the medullary part of the adrenals. In both of his cases, autopsy showed tuberculous involvement of the adrenals, the first being caseous involvement, the second being part of a general miliary tuberculosis.—J. R. G.

(THYMUS) Enlarged Thymus in Infancy. Herrick (J. F.) Surg. Gyn. & Obs. (Chgo.) 1916, xxii, 333.

Herrick asks the very pertinent question, if it is true that many cases of dyspnea in children are due to thymic enlargement, how does one explain the fact that the trachea, which is cartilaginous, should suffer compression and the veins and arteries should not? Herrick suggests that possibly the respiratory symptoms are due to pressure upon other organs. He quotes a case in which autopsy showed an enlarged thymus pressing upon the right auricle and also on the veins about the base of the heart. He also describes five other cases showing X-ray plates with thymus shadows and symptoms suggestive of thymic enlargement. These were all helped by X-ray therapy.—J. R. G.

(PITUITARY) A Case of Probable Pituitary Tumor. Craig (C. B.) Lancet-Clinic (Cincinn.) 1916, cxv, 111.

The author describes a case of probable pituitary tumor. In addition to the usual symptoms, the sugar tolerance was increased to over 300 grams of levulose. Operation had not as yet been performed—J. R. G.

(PITUITARY) A Case of Hypophyseal Tumor. Davis (T. K.) Lancet-Clinic (Cincinn.) cxv, 567.

The case showed unusually large, heavy hands and feet with coarseness and heaviness of the face. There was a typical bi-temporal hemianopsia. This case showed a sugar tolerance of over 600 grams of glucose. The patient had not, as yet, been operated.—J. R. G.

PITUITARY INFANTILISM, Pathological Report on a Case. Evans (J. J.) and Assinder, Birmingham Med. Rev. 1916, lxxx, 1.

The patient, aged 51, was first seen for failure in eyesight, headache and giddiness. Examination showed general appearance, contour and voice of a boy of 14. The height was 4 feet 7 inches; cerebration was slow and intelligence deficient. The thyroid was not palpable, breasts were prominent, the penis small and infantile and the testes soft. Optic atrophy and bi-temporal hemianopsia were marked. The X-ray showed extensive excavation of the sella turcica. The epiphyses of the long bones were unossified. No treatment had any marked effect. X-ray therapy seemed to aggravate the symptoms; thyroid therapy simply reduced his weight. Pituitary extract seemed to quiet him, increase the quantity of urine and raise the systolic blood pressure, but this was inconstant. Post-mortem revealed a tumor the size of a hen's egg in the pituitary fossa. The thyroid was in a condition resembling that of exophthalmic goiter. There was excessive subcutaneous fat and no sign of a thymus.—J. R. G.

ADRENAL Glands. Cobb (I. G.) Med. Press. and Circ. (London) 1916, cii, 186.

A good review of the literature. The author believes that the medullary secretion of the adrenals exerts an angiotonic influence while that of the cortex is myo-tonic, i. e., it neutralizes the poisonous products of muscular activity. He describes the symptoms of adrenal insufficiency and suggests that all symptoms except pigmentation can be explained by vasomotor derangement and paralysis of the sympathetic nerves. He believes milder types give rise to symptoms usually called neurasthenia.—J. R. G.

(ENDOCRINE ORGANS) A Case of Progeria. Schippers. Nederlandsch Tijdschrift voor Geneeskunde (Amst.) 1916, ii, No. 26.

Description of the fourth case of progeria. The symptoms are: Tardy closure of the fontanelles, congenital ab sence of hair and mammary glands with atrophy and pigmentation of the skin, the subcutaneous connective tissue and fat have nearly disappeared. Theories explaining this

disease: Vasiot and Peronneau think of thymus and adrenal anomalies; Charcot thought of an abnormality of the kidney; others, of the thyroid gland. In the only case in which an autopsy was made (Gilford), there were found a sclerotic thymus and sclerotic adrenals and kidneys; there was atrophy of the digestive tract.—J. K.

(THYROID) On the Connection Between "Soldier's Heart" and Hyperthyroidism. Stoney (F. A.) Lancet (London) 1916, ii, 777.

Stoney emphasizes: first, the likelihood of confounding "mild" goiters following shell shock, with neurasthenia; second, the symptomatology of beginning exophthalmic goiter; third, the rapid disappearance of symptoms following the judicious use of the Roentgen ray.

The illness usually dates back to some severe shock, such as that produced by a bursting shell or by burial. These cases are frequently sent to the base hospitals with such a diagnosis as, "shell shock," "neurasthenia," "early phthisis," along with the parenthetical diagnosis of "soldier's heart." These hearts upon examination prove to be typical of early Basedow's disease and are characterized by a practically normal rate when lying down, an increase rate, 90-100 per minute, when standing or sitting, with a normal rate when the recumbent position is again assumed. Not infrequently the heart is somewhat dilated, the action tumultuous and irregular in force and rhythm. While murmurs are often present, the characteristic auscultatory sign is an abrupt short first sound lacking in tone.

These objective heart findings with such subjective signs as fainting, weakness, dyspnea, giddiness, precordial pain and palpitation subsequent to a severe shock are indicative of an early Graves' disease. The diagnosis, however, is easily and frequently strengthened by such findings as perspiration and a fine tremor, nervousness and the other well-known signs and symptoms.

Stoney considers X-ray therapy specific in early cases, enhanced greatly by the removal of oral and intestinal sepsis along with medical management. One Sabouraud dose through one or two millimeters of aluminum as a filter to each side of the thyroid for twenty minutes, is given weekly. The exophthalmos disappears after a few weeks, the gland softens and the heart becomes regular and slower and regains its original size. In support of these observations the histories of four cases are quoted.—F. B. L.

Adrenalectomy and Gastric Ulcer. Goodman (E. H.) Prog. Med. (Phila.) 1916, iv, 40.

Nothing new except that in five cases of gastro-duodenal ulcers pathologic changes in the adrenals were reported.

J. D.

Zur Diagnose nervosen, insbesondere thyreogener Herzbeschwerden Heeresangehöriger mittels der Adrenalinaugenprobe und der Lymphocyten—auszählung. Diagnosis of thyrotoxicosis. Curschman (H.) Mediz. Klinik (Berl.) 1916, No. 10, 253.

Curschman points out the importance of Löwi's symptom in the diagnosis of thyreotoxy. Löwi's symptom depends on the fact that in normal human subjects there is no enlargement of the pupils after adrenin, but in cases of involvement of pancreas or in cases of thyreotoxy there is a marked enlargement of pupils, persisting for several hours. Associated with this is an increase of the lymphocytes, the blood picture showing between 45 per cent. and 50 per cent. lymphocytes, about 50 per cent. leucocytes and 2 or 3 per cent. each eosinophiles and transitionals. He points to the presence of Löwi's sign as an important factor in the differential diagnosis between purely nervous cardiac disturbances and those due to thyreotoxic disturbances.

(The more recent researches have failed to support either the constancy or the significance of the Löwi reaction.—Ed.)

Ueber den Einfluss eines Hormons des Corpus luteum auf die Entwickelung maennlicher Geschlechtsmerkmale. (Influence of Corpus Luteum upon the Development of Male Sex Characteristics.) Hermann (E.) and Stein (M.) Mediz. Klinik (Berl.) 1916, No. 15, 401.

In the case of rabbits, injections of corpus luteum into male animals resulted in diminution of the testicles, epidydimis, prostate, and seminal vesicles. Other microscopical changes are mentioned.

(THYROID) The Relation of Mouth Infection to Goiter. Reede (E. H.) Washington (D. C.) Ann., 1916, xv, 230.

The work of Billings, Rosenow, and others upon the seeming relation of infected tonsils and teeth to goiter is reviewed briefly. Reede comments upon his personal observation of fifty cases, below the age of twelve, in which the thyroid enlargement was coincident with a chronic gingivitis. In addition, he cites, in support of this view, the case of a nineteen year old girl, who was relieved of the symp-

toms of Graves' disease, following the removal of two abscessed wisdom teeth, although the gland still remained large.

Another case twenty-two years old, with a recurring arthritis, developed a severe pyorrhea and also a goiter following the removal of tonsils. The patient, however soon regained her health after treatment of the pyorrhea and the removal of an abscessed incisor.—F. B. L.

(THYROID) An Analysis of Fifty Cases of Dysthyroidism. Swan (J. M.) International Clinics (Phila.) 1916, 1, 777.

Swan, in rather an exhaustive study, analyzes in a statistical manner the relative frequency of signs and symptoms in fifty cases of dysthyroidea and lays particular stress on the failure of so many to recognize the early stages of goiter. Thirty-eight per cent. of his cases complained of the cardinal symptoms of the disease. If nervousness be excluded only sixteen per cent. came for relief of cardinal symptoms. Headache was present in five; tachycardia in thirty-three; exophthalmos in twenty-five; tremor in thirty-one; enlargement of the gland in forty-five; abdominal pain in nineteen; vomiting in twelve; restlessness in twenty-six. Of the eye signs, Dalrymple's was present in five cases; absent in twenty-two, no record in twenty-three. Moebius' sign was present in twelve, absent in twenty-eight, no record in ten. Nystagmus was present in twenty-six, absent in sixteen, no record in eight.—F. B. L.

(THYROID) Observations on Blood Pressure in Cases of Dysthyroidism. Swan (J. M.) Interstate Med. Jour. (St. Louis) 1916, xxiii, 186.

Swan prefaces his observations on fifty cases of dysthyroidea by stating the effect of that serum from exophthalmic goiter patients upon normal individuals. It has been found that such a serum, as well as alcoholic soluble and non-soluble residues from the struma of goiters, when injected intravenously produces a notable drop in blood pressure. In clinical observations, judging from his fifty cases, he concludes that the first effect of the intoxication is to produce a lowering of the systolic pressure with a corresponding increase in the pulse pressure. As the intoxication goes on, he finds the blood pressure rising until such a stage is reached that cardio-vascular and renal changes are produced. The cases then take on the aspect of chronic hypertension. The study of functional myocardial tests shows myocardial disturbances in all cases, whether there be clinical evidence or not. In one case, preceding hemithyroidectomy, there was a sharp fall of the systolic and pulse pressure. After operation

the systolic pressure rose to a high point, returning almost to normal following the administration of sodium nitrite.

F. B. L.

(INTERNAL SECRETIONS) Myopathy Related to the Disorders of the Internal Secretions. McCouch (G. P.) and Ludlum (S. D. W.) Med. Record (N. Y.) 1916, lxxxix, 1042.

The authors review the various myopathies, submitting the evidence which would go to show that these conditions are related to internal secretions:

Myotonia Congenita: This condition is found associated with tetany. The calcium balance is negative in those cases studied, which would suggest parathyroid involvement; lastly, the condition is found associated with impotence, testicular atrophy, loss of hair and cataract.

As regards myasthenia gravis, there is little evidence as to parathyroid involvement except that it is occasionally associated with tetany and sometimes shows a negative calcium balance. More frequently is it found with exophthalmic goiter. A further point suggestive of thyroid implication is the experimental evidence that thyroid extract depresses the voluntary muscles of the frog. Other observers have claimed that all of the symptoms of myasthenia gravis can be accounted for by low blood pressure, suggestive of adrenal involvement. Lastly the thymus has been investigated but statistics show that thymic enlargement occurs in only 28 per cent. of the post-mortems.

Muscular dystrophies lead one to suspect endocrine disturbance by the associated adiposity, and the high tolerance for sugar. The authors report a case of dystrophy in a woman aged 35 years. The symptoms had been present since 11. The patient had an infantile uterus, the X-ray showed a large sella turcica. The case combines adiposity, deficient development of both primary and secondary sexual characteristics, the small hands with tapering fingers and the enlarge sella turcica of Froehlich's disease, with the distribution of atrophy and sclera hypertrophy, proportional muscular weakness, diminution of tendon reflexes and diminished response to electrical stimuli.

In this case and several others Abderhalden tests were made. In all, there were four cases of dystrophy, one of progressive muscular atrophy, one of the perineal type of muscular atrophy and two of atrophy from syphilitic neuritis. In all but the last two cases, the reactions were positive to the adrenal and thyroid. The authors believe this further evidence of endocrine involvement.—J. R. G.

(ADRENIN) Anaphylactic Manifestations Following Cholera Revaccination. Adrenalin in the Treatment of Anaphylaxis. (Phénomènes Anaphylactiques consécutif aux Revaccination Anticholérique. L'Adrénaline dans la Traitement de l'Anaphylaxie.) Parhon (C. J.) and Bazgan (G.) C. r. Soc. de Biol. (Paris) 1917, lxxix, 506.

In view of the excellent results reported by a number of observers in their employment of adrenin injections in severe infections associated with adynamia (diphtheria, typhoid fever), the authors determined to ascertain the action of adrenalin in anaphylactic shock, in which there are present the two chief factors constituting the gravity of severe infectious diseases, namely, adynamia and low blood pressure.

The opportunity offered itself in the revaccination of three individuals against cholera. In each case a characteristic anaphylactic reaction occurred. In the first, while adrenin was being sought, ether and caffein were injected without benefit. The injection of 1 cc. adrenalin, 1:1000, brought about an amelioration of all symptoms within five minutes.

In the other two cases, adrenalin was used at once with a rapid disappearance of the symptoms.

In conclusion, the authors ask whether adrenalin may not be considered a suitable prophylactic measure in cases where anaphylactic phenomena might be expected.—A. F. B.

(ADRENALS) Toxic Lesions of the Adrenal Gland and Their Repair. Graham (G. S.) Jour. Med. Research (Boston) 1916, xxxiv, 241.

Graham produced necrotic lesions of the adrenal cortex in the guinea pig by the inhalation of chloroform, di-chlormethane and tetra-chlormethane. Similar but less constant and less extensive lesions followed the subcutaneous injection of phenol. Necrosis of the cortical parenchyma of the adrenal is common in infectious diseases both in the guinea pig and in man. During recovery from the intoxication or the infection the necrotic cortical cells are replaced by mitotic division of undamaged cells lying usually in the more peripheral levels of the cortex. Graham ventures the suggestion that the zona glomerulosa and particularly the outer levels of the zona fasciculata may constitute a growth center where cells are regenerated as needed. Mitoses occur in the chromaffin cells of the medulla, but much less frequently than in the cortex. It seems evident, therefore, that the adrenal cortex is very sensitive to poisons and its cells are readily injured or killed by them, but the cortical parenchyma also possesses a power of restoration when the cause of the lesion is

removed. Graham considers it possible that changes in the adrenal cortex may be partly concerned in the so-called "delayed chloroform poisoning."—J. P. S.

(PANCREAS) Zur Bewertung der numerischen Verhältnisse der Pankreasinseln beim Diabetes (The Islets of Langerhans in Diabetes). Heiberg (K. A.) Centralbl. f allge. Path. u. path. Anat., 1916, xxvii, 49.

Heiberg has made quantitative studies on the islands of Langerhans in the tail of the pancreas. Of 75 diabetics, 61 showed fewer than 50 islands per area of 50 square millimeters. Of 75 non-diabetics, 70 showed 76 or more islands per are of 50 square millimiters, while 17 showed more than 150. Heiberg thinks, therefore, that a quantitative study of the islands of Langerhans is as essential as a qualitative study in determining their relation to diabetes.—J. P. S.

(ADRENALS) Bilateral Infarction of the Suprarenal Bodies. Larkin (J. H.) Proc. N. Y. Path. Soc., 1915, xv, 163.

Larkin reports a case of generalized peritonitis following rupture of duodenal ulcer. At autopsy, there was found thrombosis of both adrenal veins with complete infarction of both adrenals. The author was unable to find any report of a similar case in the literature.—J. P. S.

(THYROID) Paroxysmal Tachycardia Associated with Unilateral Exophthalmos in a Case of Basedow's Disease of Long Standing. (Acces de Tachycardie Paroxystique avec Exophthalmie Unilaterale chez une Ancienne Basedowienne.) Danielopolu (D.) C. r. Soc. de Biol. (Paris) 1916, lxxix, 103.

In the author's report is described a case of Basedow's disease of 15 years duration, the manifestations of which tend to confirm the view of certain observers (Vaquez, Douzelot) that hyperthyroidism is related causally to paroxysmal tachycardia.

The striking feature of the patient discussed was the appearance of a marked protuberance of the right eye at the onset of each paroxysmal attack and the recession of the exophthalmos at its conclusion. The left eye remained normal.

This apparent relationship of exophthalmos and paroxysmal attack points to an excitation of the sympathetic as the cause of the latter, a theory in accord with the work of Hering, Douzelot and Rothberger and Winterberg, who produced attacks of heterotopic tachycardia in the dog by stimulating the left stellate ganglion. The same observers have noted that while the right sympathetic innervates the sino-auricular

node (the normal pace-maker), the left sympathetic is in relation solely to the heterotopic cardiac centers. Excitation of the left nerve possesses the property only of giving rise to an heterotopic tachycardia, the right a homotopic.

The manifestations in the case presented demand, therefore, the assumption of an excitation of both sympathetics—the right causing the exophthalmos, the left the paroxysmal tachycardia.

However, as it is known that the simultaneous stimulation of both nerves causes a tachycardia of normal origin, the homotopic center possessing a greater automaticity than the heterotopic, another factor must be adduced in the case in question to explain the abnormal source of the tachycardia. This additional factor is assumed to lie in a diseased myocardium (probably in the His bundle), itself the result of the Basedow toxins, possibly via an intermediate action on the adrenal glands.

This theory accords with the views of Vaquez and Esmon, Keith and Mackenzie, who believe that a paroxysmal tachycardia cannot originate in an intact myocardium.—A. F. B.

(PITUITARY) An Unusual Case of Acromegaly. (Un cas exceptionel d'acromégalie.) Marisnesco (G.) and Minea (J.) C. r. Soc. de Biol. (Paris) 1916, lxxi, 99.

The report concerns itself with a well-marked case of acromegaly, the unusual manifestation being an involvement of certain of the cranial nerves of the left side (I, II, V, VII, VIII). At autopsy was found a tumor of the base (the nature of which remained to be determined) arising apparently in the hypophysis and showing a tendency to grow along the trunks of the cranial nerves mentioned.—A. F. B.

THYROID Gland, The Failure of Extracts of, to Act upon Mucin in Vitro. (Absence d'action de la glande thyroide sur la mucine "in vitro.") Parhon (C. J.) and Parhon (M.) C. r. Sos. de Biol. (Paris) 196, lxxix, 504.

This report concerns itself with the origin of the mucinous infiltrations in cases of deficient thyroid secretion. The point at issue is whether the state of thyroid insufficiency leads to myxedema by reason of an action upon the nervous system, or by exerting its effect directly upon the mucin itself. The particular object of the research was to repeat the work of Nerking, who found that thyroid extracts decomposed mucin in vitro.

The materials employed were mucin obtained by Hammarsten's method from the submaxillary glands of cattle, and thyroid extracts obtained also from cattle.

The writer goes in detail into the various steps of his test tube work. His results were consistently contradictory to those of Nerking, in that he found that thyroid extracts did not decompose mucin in vitro.—A. F. B.

(THYROID) Yets over de Classificatie van Kropgeswellen (Classification of Goiters). Lanz (O.) Nederlandsch Tijdschrift voor Geneeskunde, 1917, No. 8.

Lanz, who has been professor of surgery in Switzerland and Amsterdam, compares the forms of Dutch and Swiss goiter and suggests another classification, as he considers the classification of Mayo not practicable. Goiter in Holland is nearly always atoxic; in Switzerland this form is very rare. He suggests a classification as follows:

I. Non-toxic.
   1. Diffusa parenchymatosa.
   2. Diffusa colloidea.
   3. Circumscripta: colloidea; cystica.

II. Toxic goiter.
   1. Diffusa (s. vasculosa).
   2. Diffusa (in Graves' disease).
   3. Circumscripta.

J. K.

(KIDNEY) The Effect of Nephrectomy upon the Arterial Pressure and the Probable Role of the Kidneys in the Endocrine System (Effet sur la Pression Artérielle de la Nephrectomie et Rôle Probable des Reins dans le Système Endocrine). Backman (E. L.) C. r. Soc. de Biol. (Paris) 1916, lxxix, 406.

Nephrectomy causes a fall in arterial pressure followed by a slight—though sometimes great—(premortal) rise. The author explains this as due to the removal of a normal hypertensive secretion contained in the kidneys. Brown-Séquard believed in the existence of an internal secretion in the kidneys and Tigerstedt and Bergmann demonstrated hypertensive substances in the kidneys.

The writer calls attention also to the results of a number of observers who found that nephrectomy led to a hypofunction of the adrenal glands and a disappearance of the adrenin in the glands. Hence nephrectomy and epinephrectomy produce the same effects, namely, hypotension and a fall in temperature.—A. F. B.

(Neither observation affords valid evidence in support of a specific relationship. Many factors, including trauma, cause depletion of adrenin and also low blood pressure and temperature. The theory of an endocrine function for the kidney must be held dubious without more convincing evidence than has yet been offered.—Ed.)

THERAPEUTIC EXPERIENCES

(OVARY, ENDOCRINE GLANDS) A Physiological, Clinical and Therapeutic Study of the Functions of the Ovary. Gonalons (G. P.) Dissertation (Buenos Aires) 1917.

The author made a statistical study of menstruation in 1428 women from the "Corcuato de Alvear" Hospital. It was found that in Argentinean women the menses appeared commonly at an age of thirteen years and seven months; in Spanish and Italian women at the fifteenth year; in Uruguayans at the thirteenth, and in Paraguayans at the twelfth year. In the Argentine women the flow appeared regularly at 28-day intervals in 97.08 per cent. of the cases and in the Spanish and Italian women in 85.47 per cent. The flow was more abundant in the Argentine than in the Spanish and Italian women. It commonly persisted 3 to 4 days in the Spanish and Italian, and 3 to 9 days in the Argentine women but often a duration of 3 to 5 days was observed. As to dysmenorrhea, the menses were without pain in 55.86 per cent. of the Argentine, and 55.86 per cent. of the Spanish and Italian women. As regards etiology, menstrual disorders were most common in pulmonary tuberculosis, vaginitis (?), multiple arthritis and exophthalmic goiter.

The pulse rate was noted beginning one day before the onset of menstruation and arterial pressure (with Pachon's apparatus) beginning two days before. These decreased as menstruation progressed and increased after its completion. The respiratory rate followed a similar course.

The author believes, and the statement is borne out by statements of the patients, that the psychic phenomena and objective symptoms that precede menstruation are analogous to rutting in animals.

Experimental observations: One or both ovaries were removed from animals—rabbits, white rats and cavies—and numerous grating experiments were made, using one or both glands. In a few animals Steinach's experiments were repeated (grafting gonads into animals of the opposite sex to cause inversion of the sex characteristics). These gave negative results. Histological study of 146 preparations of the adrenals, pituitary glands, thyroids, parathyroids and ovaries from the various animals showed no noteworthy departures from the normal. The only positive conclusion from this series was that the ovaries are necessary to the normal development of the other sex organs.

Toxicologic studies: It was found that: emulsions (?) and centrifugalized solutions of corpus luteum from pregnant

young cows are much more toxic than those of ovaries. All the solutions were active and caused qualitatively similar symptoms. In some but not all animals immunity could be developed. In the comparative studies rabbits of similar age and weight were used.

Pharmacodynamic studies: The action of both luteal and ovarian extracts was observed on blood pressure, heart, stomach, intestine, bladder, uterus, kidney and mammary gland. It was concluded that: Both extracts are depressor but that the corpus luteum is more effective. Neither extract contains an active principle comparable to that of the adrenal or pituitary glands. Digestion of the organ substance in HCl, extraction with fat solvents and boiling 5 minutes failed to destroy or remove the depressor substance. The effective substance (1:1 solution) is not dializable. The liquor folliculi from ovarian cysts is not active. Vagotomy or atropinization do not prevent the depressor effect of the extracts. Adrenal and pituitary extracts counteract the effects of ovarian and corpus luteum preparations. The depressor effect is regarded as due to peripheral dilatation. In the rabbit a diminished excursion of the heart beat was caused. In the frog partial heart block was observed. The tonus and rhythmic contractions of the intestine, bladder, stomach and uterus were increased but the contractions of the esophagus of the toad (Bufo marinus) were depressed. The extracts caused dilatation of the kidneys and the lactating mammae. As regards glandular secretion the results were not conclusive.

Therapeutic observations: Ovarin administered to the fasting patient in doses of 0.10 cgm to 0.20 cgm. give better results than larger doses.

In 150 cases of scanty lactation excellent success has followed the use of desiccated corpus luteum from pregnant young cows. This is administered by mouth in doses of 0.05 cgm. daily for a period of one or two weeks.—G. P. G.

ADRENAL Cortex in Aspermia. Little (S. W.) Boston Med. and Surg. Jour. 1917, clxxvi, 355.

Little reports a case of aspermia previously examined by a competent genito-urinary specialist and found to be normal. By a process of exclusion it was decided that the cells from which spermatozoa develop were probably present but dormant. We know that some of the ductless glands have a great influence on the growth and development of the generative apparatus. These glands are especially the thyroid, the pituitary and the adrenal cortex. Furthermore in this case if the fault lay in any of the ductless glands, obviously it must be a case of hypo-function.

There were no symptoms of hypo-thyroidism, such as myxedema, even in slight degree. The pituitary was ruled out also for lack of symptoms such as polyuria, drowsiness, lack of ambition, obesity, low blood pressure and the like. On the other hand two facts pointed to a former hyper-action of the adrenal cortex—the body hairiness and large size of the external genitalia. Hyper-action of any organ implies eventual hypo-action of that organ. Accordingly we acted upon the theory that this patient for an indefinite time, probably from some time after puberty, had had a condition of cortical hypo-adrenalism.

He was given 4 grains of dried adrenal cortex daily, increasing to 6 grains daily. Treatment was begun on September 23rd. On November 25th a few perfectly formed spermatozoa were found in a condom specimen. The finding was confirmed by Dr. M. Y. Casey, pathologist to St. Mary's and the General Hospital.

LYMPH GLAND EXTRACT, Its Preparation and Therapeutic Action. Hadden (D.) Amer. Jour. Obst. (N. Y.) 1916, lxxiv, 989.

The author briefly reviews the manufacture of Leucocytic Extract and Lymph Gland Extract prepared by the Archibald-Moore method. He also discusses the therapeutic action of these agents. He cites his experience with Leucocytic Extract in acute infections. He uses it as a routine procedure in connection with his surgical work in all acute septic conditions, such as acute septic appendicitis, etc. Cases of streptococcemia have proven very tractable with the use of Leucocytic Extract in conjunction with the magnesium sulphate solution advocated by Harrar.

Leucocytic Extract having proved so satisfactory, Hadden was attracted to the use of Lymph Gland Extract, which is also produced by an original digestive method by Archibald and Moore. Both these agents produce a leucocytosis in 2 cc. doses but not by reason of their protein content which amounts to less than 0.04 of one per cent.

The leucocytosis following Leucocytic Extract is due to the increase of the polymorphonuclear variety of leucocytes, while the leucocytosis produced by the Lymph Gland Extract is due largely to a greater increase of the number of lymphocytes.

Blood pictures made following the exhibition of Lymph Gland Extract in addition to the above mentioned phenomena show an enormous increase in blood platelets, which probably accounts for the fact that Lymph Gland Extract has a profound effect upon the coagulation time of blood.

The author and his co-workers are using extracts from lymph glands pre-operatively to control hemorrhage and in many pathological conditions such as hemophilia, pulmonary affairs, etc., where hemorrhage is a factor. The extract has been used by the author and some of his co-workers in a number of cases of inoperable sarcoma and carcinoma with splendid results.

There is no evidence of protein reaction or sensitization of patients even though five times the ordinary dosage is used.—G. M.

(HYPOPHYSIS) The Active Principles of Hypophyseal Extract. Houssay (B. A.) La Prensa Med. (Argent.) 1915, No. 5, 82.

A resumé of the present knowledge and the previous work of the author. After a preliminary study, Aldrich and the author in 1911 prepared from the pituitary gland an active crystalline substance. In 1913, Fuhner isolated four active substances which, together, he called hypophysin. Baudoin in the same year and, in 1914, Ancel and Bouin, published the methods of preparation. The author showed that the precipitate formed by the addition of subacetate of lead carries down the active principle which then may be recovered almost totally by manipulation at a low temperature and careful washing. Almost all the precipitate contains a larger or smaller quantity of the active substance. It is absorbed by charcoal. It is soluble in methyl alcohol but not in ethyl alcohol. The author believes from the plurality of the active substances that even the cartilaginous fish give a galactogogic extract, but this does not influence either the arterial pressure nor the smooth muscle of various organs. As it deteriorates the extract loses first its hypertensive action, then its potency as a heart stimulant. Next the action on the uterus and the intestine, and on respiration is lost. The last to disappear is the galactogogic action. The author in 1912 showed that the cerebro-spinal fluid gave reactions which slightly resembled those of extracts of the hypophysis but while the former lost its potency when treated with subacetate of lead, the latter did not. No galactagogue action from cerebro-spinal fluid could be detected. In the cerebro-spinal fluid, then, there is the same substance as in extracts of the hypophysis but in very small amounts. By the lead acetate method it is easy to detect hypophyseal secretions in the cerebro-spinal fluid. For biological assay of pituitary extracts the blood pressure and the uterus methods are advised and for the determination of minimal dosages, the galactagogue action.—Author's abstract.

(ENDOCRINE GLANDS) Beitrag zur Organtherapie der Amenorrhoe. (Endocrine Therapy in Amenorrhea.) Köhler. Zentralbl. f. Gyn. (Leipsig) 1911, xxix, 667.

Köhler has an interesting article on the subject of amenorrhea and reports his results in its treatment with various animal extracts. He publishes protocols of about thirty cases. Assuming, as he does, that amenorrhea is due to hypofunction of the ovary, his first list or group was treated with "luteoglandol," an extract of the corpus luteum of beef ovaries. Of the eight cases so treated, five were improved and in three cases there was no effect. In a second group of cases, the amenorrhea was treated with "pituglandol." While the number of cases so treated was not given, the author claimed he obtained a good result in most instances. In a third group "enteroglandol," an extract of the small intestine, was used. Of twelve cases treated by this extract he got good results in eleven and no effect in one. In one patient treated with "luteoglandol," after seven injections, her menses reappeared. Six months later, she was injected with "enteroglandol" on account of not having menstruated for the previous three months. After ten injections, her menses reappeared. This patient entered the hospital a third time for treatment for amenorrhea and was given ten injections of "placentol" (placental extract) with no effect. After two injections of "luteoglandol," the menses reappeared. Some of the cases were treated with "ovoglandol," or extract of the whole ovary, with good effect. The number of injections varied from 3 to 18. They were given daily or at intervals from two to three days, usually intramuscularly, sometimes subcutaneously.

In view of his findings that reappearance of the menses can be produced by extracts of the whole ovary, of corpus luteum, of the hypophysis and of the upper part of the small intestine, Köhler had a synthetic preparation made, consisting of several of the amines, e. g., "uteramine," histamine, phenylethylamine and isoamylamine. This synthetic preparation caused some bad after effects and hence its value in the treatment of amenorrhea could not be determined. The author adds that in cases where pituitrin is indicated, to increase the pains of labor, he has used "luteoglandol," "enteroglandol," "splenoglandol," or extracts of testicle, mammary gland or thyroid with equally good effect. The details of this study, however, he leaves for a later report.—W. H. M.

(The history of endocrine research indicates that when a given effect is produced by a variety of tissue extracts it is non-specific.—Ed.)

Organextrakte als Wehenmittel. (Endocrine Therapy in the Parturient.) Köhler. Zentralbl. f. Gyn. (Leipsig) 1915, xxxix, 891.

The author injected parturient patients with extracts of thyroid, mamma, thymus, spleen, ovary, corpus luteum, testis, placenta and one made from the mucosa of the small intestine. The injection was usually made intramuscularly, but sometimes intravenously. The effect of all these different glandular extracts was about the same, except perhaps that the splenic, placental and testicular extracts produced a somewhat stronger and more lasting effect. Then follows the protocols of his cases, which may be summed up as follows: "Enteroglandol" was used in three cases, mammary gland extract in four cases, testicular in seven cases, "luteoglandol" (corpus luteum) in seven cases, "splenoglandol" in three cases, thyroid in one case, placental extract in two cases, thymus in three cases,—in all, thirty cases. In nineteen the patients were at the end of pregnancy; in seven the injection was given in inevitable abortion; and in four cases, it was attempted to produce abortion. The effect of the injection of these various extracts was produced usually about ten minutes after the injection. In only four cases was operative interference necessary. No bad after effects were noted and the puerperium in every instance was uneventaful. The babies exhibited no injuries and only one had a slight asphyxia. Owing to the small number of observations with each extract, the author draws no conclusions and does not claim that these extracts are superior to pituitrin as an oxytocic but remarks that their cheapness makes them a deserving substitute.—W. H. M.

CORPUS LUTEUM, Experience with the Soluble Extract, with Report of Cases. Royston (G. D.) Interstate Med. Jour. 1916, xxiii, 1119.

Nausea and vomiting of pregnancy were greatly improved, although one case might have shown the same improvement under the treatment received without the addition of corpus luetum. Sexual anesthesia is a decided indication for the administration of corpus luteum. The effect in these cases justifies the assumption that this condition, so extremely common (33 1-3 per cent. of the women in Vienna, according to Oscar Frankl) will often respond to the long continued and persistent administration of corpus luteum. Sterility, in the presence of apparently normal female genitalia and living motile spermatozoa, is an indication, especially when the patient has periods of amenorrhea. Amenorrhea and oligo-

menorrhea are distinct indications for corpus luteum treatment although underlying constitutional disturbances, as obesity, tuberculosis, anemia, etc., should receive appropriate treatment. Dysmenorrhea, having a hypersensitive nervous system as a basic factor in most cases, is improved through the effect of corpus luteum in reducing this hypersensitive state. Theoretically, membranous dysmenorrhea should be an indication par excellence, because of its action in better sensitizing the endometrium. Metrorrhagia may be benefited. The most striking results were obtained in the treatment of menopause symptoms, best shown in cases of artificial (post-operative) menopause. All nervous symptoms show marked improvement, usually beginning after the third injection. A failure of improvement or relief indicates insufficient dosage. Patients with very marked symptoms can receive 1 to 2 c. cm. doses intravenously every other day without untoward effects, with quicker reaction to the substance. The effect upon patients thoroughly treated disappears two to six weeks after cessation of treatment. They can be continued on 1 c. cm. doses at longer intervals (as every seven to ten days; in same cases 1 c. cm. every two weeks). Patients who find it difficult to come twice per week for treatment can receive 2 c. cm. doses once per week, in which event the intravenous injection is recommended. The administration of corpus luteum may be intravenous, intramuscular or subcutaneous, the rapidity of effect seemingly being in the order named. The effects of the substances are of varying duration. Menstrual disturbances are apparently relieved, whereas artificial menopause patients seemingly require it indefinitely. (Short abstract previously published Endocrin., 1917, 1, 271.)

THYROID Extract, The Treatment of Eclampsia with. Quant (C. A. J.) Nederlandsch Haandschrift voor Verloskunde in Vrouwenriektes en voor Kindergeneeskunde (Leiden) 1917, vi, 53.

A compilation of the literature on the treatment of eclampsia with thyroid extract. Contains nothing new.—J. K.

SEXUAL GLANDS and Their Internal Secretions. Cobb (I. G.) Med. Press. and Circ. (London) 1916, cii, 295.

A good review containing nothing essentially new. At puberty the internal secretions of the sexual glands sensitize nervous reflexes as proven by experiments upon frogs during the spawning season. During the period of sexual activity, the frogs developed additional nervous mechanisms. Clinically the sexual glands are related to the adrenals, the hypophysis and the chromaffin system. Removal of the sexual

glands leads to changes in the thyroid, thymus and pituitary. The author suggests the use of testicular extract in neurasthenia.—J. R. G.

ADRENALIN. Practical Therapeutic Referendum. Landis (H. R. M.) Progressive Med. (Phila.) 1916, iv, 369.

The author cites from the N. Y. Medical Journal, August 19, 1916, Meltzer's procedure in the treatment of acute poliomyelitis by means of intraspinous injections of adrenalin. Two c.c. of 1:1000 solution are injected every 4 to 6 hours after withdrawing a "large" (?) quantity of spinal fluid previous to the first injection. Injections are to be continued for 4 or 5 days after all paralysis has disappeared. (Personal observations have convinced me that above treatment is absolutely without benefit to the patient.)—J. D.

PARATHYROID Gland in Paralysis Agitans. Landis (H. R. M.) Progressive Med. (Phila.) 1916, iv, 422.

Nothing original.—J. D.

PITUITARY Gland. Practical Therapeutic Referendum. Landis (H. R. M.) Progr. Med. (Phila.) 1916, iv, 428.

Nothing original.—J. D.

PANCREAS, Advances in Our Knowledge of the. Cobb (I. G.) Med. Press and Circ. (London) 1916, cii, 211.

A good discussion of the modern idea that the islets of Langerhans secrete a substance which, circulating in the blood stream, prevents an undue amount of glucose from circulating in the blood. Perhaps this secretion inhibits the formation of glucose and glycogen in the liver. The pancreas is influenced by the thyroid and parathyroids. The thyroid seems antagonistic; the parathyroids seem to enhance pancreatic activity. After pancreatectomy, no carbohydrate is found in the liver. The pancreas may be related to the adrenals, as injection of adrenin induces glycosuria. Against this argument, is the fact that glycosuria also results in a depancreatized animal. In favor of it is the observation that adrenin glycosuria can be overcome by the administration of pancreatic extract.—J. R. G.

(Later researches do not support this conception.—Ed.)

HORMONES, Therapeutic Application of. Cobb (I. G.) Med. Press and Circ. (London) 1916, cii, 488.

The author reviews the different therapeutic applications of hormones, showing how extracts of endocrine glands play

an important role in our therapeutics. Pituitrin as used in labor, adrenin in cases of low blood pressure, spermin in neurasthenia, and thyroid in myxedema and cretinism, and also in some cases of enuresis. As regards the latter, he quotes the interesting idea of Hertoghe that enuresis is due to thyroid deficiency. His explanation is that the thyroid gland influences the nutrition of the skin, and in a like way the mucous membrane of the bladder is affected, and in cases of thyroid deficiency, desquamation of the epithelium leaves the bladder wall more sensitive to the irritation of the urine.

—J. R. G.

(The matter should be subjected to a conclusive experimental investigation.—Ed.)

ORGANOTHERAPY of Menorrhagia. Pulvermacher (P.) Med. Klin. (Berl.) 1916, No. 7, 182.

Pulvermacher injected principally: Glanduitrin and Hypophysin, in a few cases Luteo-glandol, a watery extract of the entire ovaries of cows or of the corpus luteum. He outlines in detail the treatment of cases presenting various complicating factors and reports excellent results.

(ADRENIN) The Action of Adrenalin in a Case of Incomplete Auricular-Ventricular Dissociation. (Action de l'Adrénaline dans la Dissociation Auriculo-Ventriculaire Incomplete.) Danielopolu (D.) and Danulescu. C. r. Soc. de Biol. (Paris) 1916, lxxix, 105.

The authors found in a case of 2:1 heart block that the injection of adrenalin Takamine (0.0015) caused the dissociation almost entirely to disappear in four minutes. In addition the rhythm of both auricles was considerably accelerated by the adrenalin and different types of extrasystoles appeared.

"All these phenomena are the result of the exciting action of adrenalin upon the sympathetic nervous system. The researches of Rothberg and Winterberger have shown that the normal center of cardiac contraction is innervated by fibers from the right sympathetic nerve, while the left sympathetic is related only to the bundle of His and to the centers of heterotopic contractions. The auricular acceleration in our case is to be explained on the basis of excitation of the right sympathetic, while the ventricular acceleration and the disappearance of the dissociation are the results of stimulation of the left nerve. As for the extrasystoles, they can be explained only by the hyperexcitability of the heterotopic centers due to the action of the left sympathetic nerve."—A. F. B.

(ADRENALIN, PITUITRIN) Hemorrhage of the Newborn, with the Report of a Case. Shaw (H. L.) Jour. S. Carolina Med. Assn., 1917, xiii, 408.

In an infant with profuse intestinal hemorrhages, adrenalin (by mouth) was of no value, while pituitrin (hypodermatically), given at first in doses of one minim every four hours, and later of two minims every eight hours, gradually caused the diminution and finally the cessation of the bleeding.—A. F. B.

(PARATHYROID) Treatment of Tetania Parathyropriva with Parathyroid Substance from the Horse. Stenvers (H. W.) Nederlandsch Tijdschrift voor Geneeskunde (Amsterdam) 1917, i, No. 2.

A patient with exophthalmic goiter undergoes thyroidectomy. Immediately, on the operating table, he suffers from a severe, very painful attack of tetany.

The patient is treated with fresh parathyroid glands of the horse, which were identified microscopically and given mixed with the food. The result was controlled by the electrical reaction of the muscles, the concentration of creatinine in the urine and the general appearance of the patient. During six weeks the administration of parathyroid went on. Then three parathyroid glands (of patient with exophthalmic goiter) were implanted. The effect has been splendid and the patient has been restored to perfect health.—J. K.

(THYROID) Uber die Wirkung der Schilddrüse auf den Blutkreislauf. Oswald (A.) Pfluger's Archiv. 1916, clxiv, 506.

Iodo-thyroglobulin increases the responsiveness of vagus terminations, depressor nerve, and sympathetic to faradic stimulation. It increases the hemodynamic power of adrenalin, and is regarded as a most important stimulant to various body processes. Its activity is proportional to its iodine-content. Baumann's iodothyrin has similar but weaker activities. Other iodine compounds of protein and protein products (iodo-casein, iodo-tyrosin, etc.) have no effect. Iodo-thyroglobulin obtained from the thyroid in cases of Basedow's disease acts like that obtained from the nomal organ. All the symptoms of hyper- and hypothyroidism are explicable on the hypothesis that iodo-thyroglobulin is the effective agent concerned.—(Physiol. Abstr.)

ADRENALIN, Action of, on the Leucocyte Blood-Picture in Man. Castrén (H.) Finska Läkaresällskapets Handlingar (Helsingfors) 1916, lviii, 1605.

Half an hour after the injection of 0.001 gm. of adrenalin

in man, there is a marked increase in the lymphocytes, and a less pronounced increase in the polynuclear leucocytes. A somewhat similar result follows on muscular exercise. It is due to a driving out of the colorless cells from blood-forming organs. In one case with an enlarged spleen, that organ was reduced in size by the adrenalin.—(Physiol. Abstr.)

(LYMPH EXTRACT) Sull'azione biologica dell'estratto di gangli linfatici e sulla funzione ormonica degle stessa. Marfori (P.) Arch. di. fisiol. (Firenze) 1916, xiv, 285.

Observations on the effects of a sterilized extract of lymphatic glands. These organs yield a substance, soluble in hot and in cold saline solutions, which is thermostable, for which the name "lymphogangline" is suggested. Lymphogangline is physiologically antagonistic to adrenalin. It diminishes cardiac tone and frequency, even under atropine. It dilates systemic arterioles, but constricts the coronaries. Moreover, it constricts the pupil, and inhibits adrenalin glycosuria. Lymph, from the thoracic duct, and from the pancreas of Aselli, produces effects similar to those of the lymphogangline. Both in modus operandi and in effect lymphogangline is regarded as a complete antagonist to adrenalin.—(Physiol. Abstr.)

(LYMPH EXTRACT) Azione antagonistica fra l' estratto di gangli linfatici e l'adrenalina sugli organi a fibre muscolari liscie. Chistoni (A.) Arch. di fisiol. (Firenze) 1916, xiv, 307.

Extension of Marfori's work to excised organs.

Lymphogangline antagonizes adrenalin on esophagus, intestine, uterus, and arteries, in Ringer's solution, in vitro. It appears, both from Marfori's and from Chistoni's account, that lymphogangline is very similar in its effect to B-iminazolylethylamine.—(Physiol. Abstr.)